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IN THE
Supreme Court of the United States

OCTOBER TERM, 1983

STATE OF COLORADO, *Plaintiff*

v.

STATE OF NEW MEXICO
AND PAUL G. BARDACKE,
ATTORNEY GENERAL OF THE
STATE OF NEW MEXICO, *Defendants*

**EXCEPTIONS OF THE STATE
OF NEW MEXICO TO THE ADDITIONAL
FACTUAL FINDINGS OF THE
SPECIAL MASTER AND BRIEF IN
SUPPORT OF EXCEPTIONS**

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**EXCEPTIONS TO THE ADDITIONAL FACTUAL
FINDINGS OF THE SPECIAL MASTER**

In *Colorado v. New Mexico*, ____ U.S. ____, 103 S. Ct. 539 (1982), the Court remanded this case to the Special Master to make " 'specific factual findings' relevant to determining a just and equitable apportionment of the water of the Vermejo River." 103 S. Ct. at 549. The Court held that the Master's first report, dated December 31, 1981, did not contain sufficient factual findings to permit review of his recommendation that Colorado be awarded 4,000 acre-feet per annum of Vermejo River water. 103 S. Ct. at 545. To assist the Master, the Court requested detailed findings in five areas, directing the Master to undertake a thorough, comprehensive, and objective analysis of all facts bearing on the issue of an apportionment of the river and stating that additional hearings could be held where necessary. 103 S. Ct. at 549, n. 14.

The Court imposed a heavy burden of proof on Colorado to provide evidence on which the Special Master could base specific findings in the five areas. "Colorado must establish not only that its claim is of 'serious magnitude,' " but also that its position is supported by "clear and convincing evidence." 103 S. Ct. at 548, n. 13. The Court held that [t]o the extent that the Special Master found that the mere fact that the Vermejo River originated in Colorado automatically entitles Colorado to a share of the water of the Vermejo River, "... we reject it as inconsistent with our emphasis on flexibility in equitable apportionment." 539 S. Ct. at 544, n. 8.

Upon remand, the Master immediately issued an Order requiring the parties to prepare briefs of the record. On March 5, 1983, New Mexico submitted a Motion to Receive Evidence. The Motion covered three evidentiary elements of the case which were directly relevant to the areas in which the Court had requested specific findings. The motion was denied.

New Mexico takes exception to the exclusion of the evidence contained in our Motion to Receive Evidence from the record and to the fact the Master failed to make the specific findings requested by the Court in the five categories. The Master has failed to comply with the Court's mandate of December 13, 1983, and Colorado has failed to sustain its burden of proof.

Specifically, New Mexico takes exception to the report in the following respects:

- (i) The Master's exclusion of evidence contained in our tender denied New Mexico its right to a hearing at which to present evidence of Vermejo River flows to the Canadian, depletions by stockpounds, and the equities arising from the District's closed pipeline.

(ii) The Master's analysis of New Mexico's existing uses failed to take account of the Court's request that he determine the extent to which the existing uses were restricted by shortage or were not diligently developed. The Master's analysis began in 1973. He ignored New Mexico's evidence of the historical development of these rights.

(iii) The Master's discussion of the Vermejo River hydrology is in error in two respects. The Master relied upon average annual flows as his measure of practical availability, a method of analysis expressly rejected by the Court, and failed to comprehend the magnitude of the demand in comparing historic supply and demand. As a result, he concluded that certain acreage was left fallow in the 1970s because of lack of diligence as opposed to water shortage.

(iv) The Master generalizes about water conservation measures in New Mexico without specifically identifying any particular conservation measure and without discussing the economic or physical feasibility of any given measure.

(v) In discussing the nature of proposed interim and ultimate uses in Colorado, the Master concedes that specific findings cannot be made. As a result, he idealizes the proposed use in Colorado and criticizes the existing uses in New Mexico, basing his recommendations upon an inherently unfair double standard.

(vi) Based upon his failure to appreciate the demand in relation to the historic supply, the Master does not realize that he is recommending permanent injury to New Mexico by reducing its legitimate demand by the amount of water needed to irrigate 3,839 acres. He also fails to recognize that all of the existing uses in New Mexico would be injured in times of low flow and that the Canadian River users of Vermejo water

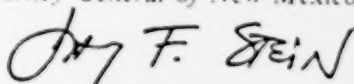
would be injured during times of flood flow. Accordingly, the Master mistakenly attributes little significance to the economic consequences in New Mexico of a diversion of 4,000 acre feet in Colorado.

(vii) The Master recommends restructuring priorities interstate to award the first priority to the most junior use without basis in law or equity.

WHEREFORE, the State of New Mexico requests that the Court reject the Special Master's reports of December 31, 1981 and May 31, 1983, to dismiss this action with prejudice to Colorado for failure to meet its burden of proof, and to enter its decree declaring that the factors the Court sought to have the Master consider do not warrant variation of the guiding principle of prior appropriation.

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**BRIEF OF THE STATE
OF NEW MEXICO IN
SUPPORT OF EXCEPTIONS**

INTRODUCTION

In *Colorado v. New Mexico*, _____ U.S. _____, 103 S. Ct. 539, 546 (1982), the Court stated that it was New Mexico's view that it "is improper to consider" the various factors the Court discussed to determine whether to vary the application of priority of appropriation between priority states. New Mexico did not so contend, however. On the contrary, we maintained that given the facts of this case these factors are of no avail to Colorado.

The record shows that New Mexico presented extensive evidence on the historical uses of water from the Vermejo River, balancing periods of water shortage against the possibility of lack of diligence to make it possible to ascertain New Mexico's diligently developed entitlement. We presented extensive evidence on the need to adopt a standard of practical availability

as the measure of "available supply," accounting for flood flows, the possibility of regulating and conserving the supply, and the possibility of relieving the demand for Vermejo water with water from alternate sources. We also presented extensive evidence with regard to waste, inefficiency, and the economic and physical feasibility of conservation measures which might augment the supply in order to offset a new diversion in Colorado.

In New Mexico's opinion, the facts presented did not warrant variation of the guiding principle of prior appropriation, but rather compelled its application. By contrast, Colorado presented no analytically useful evidence in regard to any of the factors discussed by the Court and instead simply generalized, without specific factual support, about how New Mexico might offset a new diversion.

The Master adopted the generalizations, neglected to weigh the evidence needed to reach informed conclusions, and explained to the Court that New Mexico wanted simply to apply priority. The result is the necessary length of this brief. Without an explication of the evidence, which the Master has not provided, the Court cannot "assess the correctness of [his] application of the principle of equitable apportionment to the facts of this case." *Id.* at 545.

SUMMARY OF ARGUMENT

Point I

In his initial report the Special Master stated that "[o]ne of the major difficulties confronting [him]. . . is the lack of reliable streamflow measurements." Report of December 31, 1981 at 2. After trial, crucial measurements became available as a result of the installation of a U.S.G.S. gauge. Because these measurements and other post trial data are of critical importance to three of the areas in which the Court instructed the Master to make specific findings, New Mexico moved to have the new evidence heard by the Master. *See Motion to Receive Evidence*, March 5, 1983. Despite his own recognition of the need for hard facts, the Master denied our motion.

The new U.S.G.S. measurements prove that the Master's use of average annual flow to assess water availability is wrong, as the Court has previously recognized with respect to other western streams. The data also show that the Vermejo River doesn't stop flowing at the Vermejo Conservancy District's headgate, but rather proceeds downstream to form part of the historical supply of the Canadian River users.

We also sought to introduce relevant data in a new technical report and the results of a hydrographic survey conducted to identify, locate, and determine the annual depletion from stockponds in the Vermejo drainage. At trial, Colorado persuaded the Master that "hundreds" of Vermejo stockponds deprive the Vermejo Conservancy District of "at least 2,000 acre-feet" of water on the basis of a single, factually unsupported statement of apprehension by a former District official that the District's water shortage was caused by the stockponds. The facts the Master excluded show unquestionably that there are few stockponds, that they constitute a beneficial use of long standing, and that the water they deplete is insignificant in regard to the water shortage experienced by the Vermejo Conservancy District.

The Master's exclusion of the tendered evidence was highly prejudicial and denied New Mexico the right to a hearing.

Point II

In its first opinion in this case the Court requested that the Master make specific findings of fact showing the existing uses of water on the Vermejo, balancing the possible lack of diligence with historical water shortage to determine whether any nonuse is excusable or should form the basis for forfeiting part of New Mexico's entitlement. To do so the Master had to weigh the historical supply against the demand.

The Master first cut New Mexico's demand for Vermejo water by eliminating the Canadian River uses on the theory that the Vermejo River comes to a dead end at the Vermejo Conservancy

District's diversion dam. The effect of the Master's conclusion, which flies in the face of U.S.G.S. gauged flows, is to ignore a part of the Canadian users' water rights and thus to permanently injure the existing New Mexico economy.

On the Vermejo itself the Master purports to weigh supply and demand and concludes that there has been plenty of water historically. It is apparent, however, that the Master didn't comprehend the demand. As a result, he did not actually weigh supply and demand to ascertain whether there have been historical shortages, but instead surmised that the acreage not irrigated in the 1970s was not irrigated because of lack of diligence.

The State of New Mexico, the Bureau of Reclamation, the United States Congress, and the Vermejo water users disagree with the Master. For the period 1950-1979 the facts show an aggregate supply of 297,720 acre-feet in the river and an aggregate demand of 510,000 acre-feet, resulting in a shortage of 212,280 acre-feet, which the Master inexplicably views as a plus. In the 1970s, which was the period in which the Master found that certain water users were not diligent because of nonuse, the demand was not met in any year, and the streamflow records show profound shortages. Blaming an act of God on the New Mexico users, the Master recommends forfeiting nearly half of their water rights and giving their water to C. F. & I.

Point III

The Court also asked the Master to assess the available supply by accounting for variations in streamflow, the possibility of making more water available by conservation or storage, and the possibility of freeing Vermejo water through the use of alternate sources of supply. Instead of making specific findings, the Master adopted a method of analysis which the Court has recognized cannot work, and he weighed the supply and demand again without appreciating the demand. He recommends that a Kafkaesque standard of efficiency and conservation be applied to

New Mexico, concluding without basis in the record that New Mexico might do this and might do that, not specifying a single conservation measure and not discussing the feasibility of any particular measure. He concludes by asserting that the demand for water on the Vermejo can be relieved with some of the water already being used.

Point IV

The Court specifically isolated the possibility of water conservation which might eliminate waste and inefficiency. In response the Master makes no specific findings, saddles New Mexico with a Utopian standard of efficiency and conservation, and concludes that no standard at all need apply to Colorado despite the Court's instructions.

Instead of analyzing specific conservation measures to determine whether they are economically and practicably feasible, the Master concludes that he need not be specific and further that he need not temper his generalities with any measure of feasibility. As a result, he surmises the possibility of conservation measures in general, with no support from the record. Pursuing a double standard, the Master concludes that Colorado shouldn't suffer the Vermejo Conservancy District's hopeless inefficiency, notwithstanding that the record shows that the District falls in the middle range of reclamation project efficiencies. In other words, regional practice in the Master's mind is no measure of economic or physical practicability.

With regard to the one specific conservation measure that the Master does discuss, which was undertaken by New Mexicans a decade before this suit was filed and was completed in November, 1982, the Master appears to recognize that the New Mexicans deserve to reap the benefits of their labor, but recommends giving the water conserved to C. F. & I. In his discussion of the historical supply and demand, the Master fails to recognize that the water conserved by the new pipeline is not

sufficient to offset the historical shortages, much less make water available for a new use in Colorado without forcing permanent, substantial injury in New Mexico. In effect, the Master proposes that the Court guarantee shortages in the future to the farmers in the Vermejo Conservancy District.

The Master also finds that "administration" in New Mexico could, in some unexplained way, conserve enough water to satisfy everyone. He fails to credit the extensive administration that in fact exists in New Mexico and suggests that priority administration is the key to conservation. He doesn't recognize that priorities are administered only to relieve the shortage he maintains does not exist. He fails to understand that strict priority administration in New Mexico during times of short supply would conserve no water for use by C. F. & I. in Colorado. In the Master's mind, priority of appropriation between appropriation states is not only not the guiding principle, but no principle at all.

Point V

In its first opinion in this case the Court extended the principle of balancing benefit to one state against harm to another to the circumstance of a proposed future use on a fully appropriated interstate stream. In doing so the Court recognized that the equities supporting the existing economy would usually be compelling, *i.e.*, would preclude the development of a new use to the detriment of existing uses. The Court also recognized the danger inherent in attempting to balance existing uses with undefined, speculative uses.

The record demonstrates the Court's concern. The Master could not make specific findings of the precise nature of the proposed use in Colorado because the use has not been contemplated with any precision. As a result, the Master

idealized the proposed use. On the other hand, the Master was quick to criticize the existing uses. Proceeding with this double standard, the Master balanced the ideal with the mundane and undermined the principle that the existing equities would usually be compelling.

The kind of balancing recommended by the Master has never been undertaken by the Court before. The Court has never weighed speculative economic value against the equities supporting an existing economy. Nor has the Court ever compared idealized future benefit with existing "inefficiency" in order to determine whether to sacrifice one use for another.

Point VI

The Master's analysis of injury begins with a foregone guarantee of injury, *i.e.*, he blames the drought of the 1970s on the New Mexico water users and punishes them by reducing their water right acreage by 3,839 acres. While the law is clear that property rights in water are not lost or forfeited for reasons beyond the control of the water users, the Master nevertheless deprives them of their rights and begins his discussion of injury with this deprivation behind him.

In an attempt to justify his action, the Master explains that the Vermejo Conservancy District, the user that will suffer permanent, profound injury, has a system of reservoirs and can carry over water to meet the additional shortage caused by the proposed Colorado diversion. His own figures, however, prove that there has not been sufficient supply to meet the demand since 1965. Consequently, there was no water to carry over either to or in the 1970s, the period the Master uses to reduce the New Mexico entitlement.

The Master rationalizes his recommendation on the ground that it really doesn't matter that the Vermejo Conservancy District and thus the United States will be injured. The United States, according to the Master, can afford the loss, and the guarantee that the Vermejo Conservancy District would not be productive enough to repay its debt to the United States should not be of any concern to the Court.

The Master is also of the view that the Vermejo Conservancy District should be sacrificed to C. F. & I. because it has not been profitable in recent years. While the District's homes, farms, farm machinery and implements, and related capital improvements are not recognized in the Master's accounting, he recommends that the District should be allowed to die because the water supply anticipated by the Bureau of Reclamation when it rehabilitated the Vermejo Project has not materialized. Profitability, however, has never been a measure of the beneficial use of water in any state in the West. If it were, the Court could order that most agricultural uses give way to more economically productive industrial uses. The present drought on the Vermejo, which appears to have dissipated with the improved water supplies of the 1980s, should not make the Court intolerant of the Vermejo Conservancy District. The Court has never apportioned interstate water on the theory that one state can speculatively make a better use of the water. 103 S. Ct. at 551.

The record shows the historic shortages to demand without question, but the Master does not appear to appreciate the numbers. Economically, as well as hydrologically, the injury to New Mexico would be profound. With a guaranteed reduction of 3,839 acres, New Mexico would be injured severely, and the economic ramifications would spread through Colfax County, the State of New Mexico, and into southern Colorado. Beyond the guaranteed loss, there would be additional loss to all New

Mexico users in low flow years and to the Canadian River users of Vermejo waters in high flow years. The economic quantification of these losses would depend on nature, but would be substantial. Utilizing Colorado's technique of assessing the benefits that would derive from the speculative use of Vermejo water in Colorado, an award of 4,000 acre-feet to Colorado would cause New Mexico to lose 1,875 jobs or 31% of the jobs and 40% of the total income of Colfax County. The loss in annual tax revenues to the State would be \$2-3,000,000. The loss to Colfax County and the State in terms of personal investment and social stability would be devastating.

Point VII

The Master bases his recommendation that Colorado be awarded 4,000 acre-feet of water on factors which would augment the water supply of the Vermejo river; gratuitously, the Master also recommends awarding C. F. & I. the first priority on the river.

It is one thing to make an equitable apportionment to a new use on a fully appropriated river on the basis of augmentation. It is quite another thing to restructure priorities interstate without offering a reason to do so.

ARGUMENT

POINT I

NEW MEXICO WAS DENIED THE RIGHT TO A HEARING ON ESSENTIAL EVIDENCE.

In remanding this case to the Special Master to make specific factual findings relevant to the question of an apportionment of the Vermejo River, the Court indicated that additional hearings might have been held where necessary to provide the findings that the Court requires. 103 S.Ct. at 549, n. 14. This comports

with the liberal, comprehensive fact finding process that the Court encourages in actions within its original jurisdiction. *New York v. New Jersey*, 249 U.S. 202 (1919); *United States v. Wyoming*, 331 U.S. 440 (1947). In *United States v. Texas*, 339 U.S. 707 (1949), the Court held that "[t]he Court in original actions, passing as it does on controversies between sovereigns which involve issues of high public importance, has always been liberal in allowing full development of the facts." 339 U.S. at 715.

New Mexico's Motion to Receive Evidence of March 5, 1983, set forth three areas in which New Mexico sought to present evidence. They included the extent of the contribution made from the Vermejo River into the Canadian River, depletions of Vermejo water by stockponds, and the completion of conservation measures instituted by the Vermejo Conservancy District. These areas of evidence relate to matters on which the Court expressed interest in its December 13, 1982 opinion. See, e.g. 103 S.Ct. at 550, n. 2. Consideration of this evidence was essential to an objective and accurate fact finding process. By excluding the tendered evidence the Special Master effectively denied representation to New Mexico's interests on the Canadian River and prepared a report warped by inaccuracies.

In his first report, the Special Master found that the Vermejo was virtually "a closed system." Report of December 31, 1981 at 2. The Master's basis for this conclusion was not factual. He stated that "no calls have ever been made for the water by the downstream users." *Id.* at 4. In December of 1980, the United States Geological Survey, in cooperation with the State of New Mexico, installed a streamflow gauge on the Vermejo Conservancy District's Canal below the Dawson gauge. This enabled measurement of actual diversions by the Vermejo

Conservancy District and contributions to the Canadian River. It was therefore possible to obtain specific measurements of flows from the Vermejo River into the Canadian River for the first time.

The data from the gauges show that a total of 12,000 acre-feet of Vermejo River water was contributed to the supply of users on the Canadian River in 1981 and 1982 alone. *See* Amended Narrative Tender of Evidence and Requested Findings of Fact and Conclusions of Law, at 6-9, 11. Receipt of this evidence would have required the Master to acknowledge the Vermejo contribution to New Mexico's rights on the Canadian River. The Special Master's exclusion of this evidence is all the more perplexing because he began his first report by noting that "[o]ne of the major difficulties confronting the Special Master in this case is the lack of reliable streamflow measurements." Report of December 31, 1981 at 2.

With regard to the stockpond evidence, the Special Master's first report condemned New Mexico's uses as wasteful due to the presence of "unadministered" and "unlimited" stockponds which account for "a substantial depletion of the Vermejo's flow." *Id.* at 7. New Mexico has contended that this finding was based on a single, unsubstantiated hearsay statement contained in certain Colorado exhibits. Tr. 32. After the Court remanded the case, New Mexico promptly undertook to quantify the depletions from stockponds for the Special Master. New Mexico's motion to receive this evidence was denied and the Special Master proceeded to repeat his earlier ruling, citing New Mexico's "unregulated stockponds, fishponds and water detention structures" as a cause of waste on the river. Report of May 31, 1983 at 18. The Special Master referenced two Colorado exhibits in support of his conclusion. It had been Colorado's position in the briefs on remand that "the

stockponds, fishponds and water detention structures on the Vermejo River deplete the River of a substantial amount of water." Brief of the State of Colorado Pursuant to Special Master's Order of December 30, 1982 at 38. Colorado contended that "[t]hese structures capture at least 2,000 acre-feet annually." *Id.* at 29, n. 13. Colorado stated that the number of stockponds was "something more than 200." *Id.*

The actual figures tell a very different story. In 1982, the State of New Mexico published Technical Report No. 44 in conjunction with the U.S. Geological Survey. The report included water depletions by county from stockpond evaporation. N.M. Ex. No. F-53, Table 4. Based upon new data in the report, it was possible to estimate the depletion to the Vermejo River above the Vermejo Conservancy District's diversions due to stockponds. See New Mexico's Brief on Remand, at 52-53. Using these data, we estimated an annual depletion of 170 acre-feet. We then undertook an actual hydrographic survey of all of the stockponds in the Vermejo River system above the Vermejo Conservancy District's diversion points to verify this estimate. The survey was conducted by registered surveyors under the direction of Eluid Martinez, the Chief of the Hydrographic Survey Section of the New Mexico State Engineer Office. All of the stockponds were identified and located in the survey. See Amended Narrative Tender of Evidence and Requested Findings of Fact and Conclusions of Law, at 2-4.

A representative sample consisting of 31% was surveyed by planetable mapping to determine the maximum water surface and depth of the ponds. Volume was also determined. The following facts were established:

- (i) there is a total of 80 stockponds in the entire Vermejo River drainage in New Mexico above the Vermejo Conservancy District's diversions;

(ii) there are no unadjudicated "fishponds" or unauthorized flood control structures in the Vermejo River drainage in New Mexico;

(iii) the aggregate capacity of all stockponds in service at maximum water surface level is calculated to be 212 acre-feet; and

(iv) while the actual depletion is less, the maximum annual depletion from all of the stockponds ranges from 182 to 192 acre-feet, which includes 10 to 20 acre-feet consumed annually by livestock and wildlife. *Id.*

This evidence, had it been considered, would not have allowed the Master to make inaccurate findings of water shortages caused by waste in "unregulated stockponds, fishponds and water detention structures." Report of May 31, 1983 at 18.

While the Master rejected the only evidence regarding the completion of the District's closed stockwater system designed to save 2,000 acre-feet annually, he commends its completion. Without providing either legal or equitable justification, the Master recommends that water that the District has indebted itself to salvage to mitigate shortages be awarded to Colorado. While rejecting our tendered evidence, it is apparent that the Master selectively used certain facts contained therein. New Mexico should have been afforded the opportunity to have presented all of the relevant evidence which became available after trial.

POINT II**THE SPECIAL MASTER FAILED TO MAKE FINDINGS WHICH WOULD SHOW EITHER THE NUMBER OF NEW MEXICO'S USERS DEPENDENT ON THE VERMEJO RIVER OR THE EXTENT TO WHICH THESE USERS HAD DILIGENTLY DEVELOPED THEIR RIGHTS.**

The Court required the Special Master to make specific findings of fact showing both "the existing uses of water from the Vermejo River, and the extent to which present levels of use reflect current or historical water shortages or the failure of existing users to develop their uses diligently." 103 S. Ct. at 548-49. To respond to the Court on this point, the Special Master had to identify the users with rights in Vermejo water and determine the impact of water shortage or lack of diligence in the development of the rights. He failed to do either. Consequently, his conclusions are erroneous.

The Special Master erred in describing the existing uses of water from the Vermejo River in New Mexico by wrongly excluding New Mexico's uses on the Canadian River from consideration. This exclusion was made despite uncontroverted evidence from trial that certain users on the Canadian River had rights in Vermejo water and despite his awareness of more recent data showing flows from the Vermejo into the Canadian River. *See* New Mexico's Motion to Receive Evidence of March 5, 1983, and Amended Narrative Tender of Evidence and Requested Findings of Fact and Conclusions of Law, at 6-9, 11. Secondly, the Master erred by describing the restricted level of use in the drought period of the late 1970s as the extent to which New Mexico's rights on the mainstem Vermejo have been diligently developed. In neither instance has the Special Master complied with the mandate of the Court to submit "specific factual findings" which show New Mexico's uses from the Vermejo or which evaluate the extent to which the uses on the mainstem Vermejo have been influenced by drought.

At the beginning of the report the Master states that there are "nine existing users of the Vermejo River which were mentioned during the course of this case." Report of May 31, 1983 at 2. In fact, there are fourteen. Five of these divert from the Canadian River but have rights in Vermejo water that is contributed to the Canadian below the confluence of the two rivers. They were mentioned throughout trial. Tr. 1044, 1055, 1131-32, N.M. Ex. Nos. G-4, G-5, G-16, G-17, G-18. Included are irrigation rights for the Arch Hurley Conservancy District consisting of 42,213 acres, together with 300,000 acre-feet of storage rights in Conchas Reservoir, the New Mexico Interstate Stream Commission's 200,000 acre-feet of conservation storage rights at Ute Reservoir, and irrigation rights for the Bell Ranch (1,002 acres), Bruhn and Sons Ranch (157 acres), and the Sabinoso Community Ditch Association (163 acres). These users have experienced chronic shortages. Tr. 1368-78, 2223-25. As the testimony showed, they rely upon water contributed by the Vermejo River. Tr. 1044, 1131-32, 2218-2336.

New Mexico has long contended that Colorado's analysis excluded the Canadian rights because Colorado attempted to minimize New Mexico's requirements for Vermejo water. The reasons given by Colorado for ignoring the Canadian rights at trial demonstrate strategy decisions totally unsupported by any factual examination or analysis.¹ We took exception to this exclusion in the Master's first report, in which the Master had purported to make the factual finding that the Vermejo was a "closed system" on the basis of an erroneous legal conclusion.²

¹ At trial Colorado's chief hydrological witness, Mr. Helton, testified that no consideration had been given to rights on the Canadian River because they were not "deemed to be relevant." Tr. 303. Three reasons were given for this: (i) the Vermejo Conservancy District has never relinquished water to downstream users; (ii) there is no requirement to do so; (iii) no calls have been made on Vermejo users to pass water to users on the Canadian. Tr. 280-83, 286-88. None of these reasons is based upon hydrological analysis.

² In his first report the Master found "no competent evidence of any dependency on Vermejo water by users downstream from the Vermejo Conservancy District" because no downstream users had made calls on

Report of December 31, 1981 at 2. There is a revealing contradiction in Colorado's position. When C. F. & I. Steel Corporation first applied for a water right in the Water Court for Water Division No. 2 in Case No. W-3961, the application was denied because the water court concluded that it lacked jurisdiction because the Vermejo tributaries were not tributary to the Arkansas River. Tr. 731. C. F. & I. moved to reconsider, arguing that the contrary was true. Mr. Adkins, the C. F. & I. official with responsibility for the application, testified, "I was pleased to provide [the Water Court]. . . with a geography lesson in which I showed him this is a tributary of the Canadian which is a tributary of the Arkansas River. . . ." Tr. 731-32.

It is in this context that the Court must view the Master's exclusion of evidence obtained since trial by the United States Geological Survey. As indicated in our Narrative Tender of Evidence submitted to the Special Master on May 13, 1983, a gauge was installed by the United States Geological Survey on the Vermejo Canal of the Vermejo Conservancy District in late 1980. The purpose of this gauge was to measure flow into the Vermejo Conservancy District reservoirs and to determine the amount of Vermejo water contributed to the Canadian River. In February of 1983, published records became available for the water year 1981. In April of this year, provisional records became available for the water year 1982. With minor alterations, the 1982 data were verified by the U.S.G.S. on May 17, 1983. These records provide a direct basis for

Vermejo users to pass water down to them. Report of December 31, 1981 at 4. However, as the Court recognized in its opinion of December 13, 1982, both Colorado and New Mexico are governed by the law of prior appropriation. 103 S. Ct. at 543, n. 4. "A distinctive feature of the prior appropriation doctrine," the Court noted, "is the *rule of priority*, under which the relative rights of water users are ranked in the order of their seniority." 103 S. Ct. at 543, n. 4. While senior rights can place calls on junior users to pass water to them in times of short supply, junior users cannot call upon seniors. The users on the Canadian River are all junior to those on the Vermejo. Tr. 1044, 1046.

calculating the amount of water passing the Vermejo Conservancy District's headgates into the Canadian River. New Mexico asked the Special Master for the opportunity to present this evidence. *See* Motion to Receive Evidence of March 5, 1983. Colorado strenuously resisted allowing New Mexico the opportunity either to present the evidence at hearing or to tender the evidence to the record for purposes of review by this Court. The motion was denied.

Calculations of contributions to the Canadian were made by subtracting the flow diverted by the District from the flow at the Dawson gauge during flood events. The amount of water in the Vermejo River at the Dawson gauge from June through September of 1981, and from May through September of 1982, was 26,710 acre-feet. Of this amount, 12,490 acre-feet were actually diverted by the District. During that time there was a depletion of 2,220 acre-feet between the Dawson gauge and the Vermejo Canal gauge caused by Phelps Dodge and the five private users. This depletion occurred during the months of June and July of 1981, and May, June, and July of 1982, when there was no spill at the District's diversion headgates, and represents the difference between the recorded flow at the Dawson gauge and the recorded flow at the Vermejo Canal gauge. The data from the gauges show that in August and September of 1981, approximately 5,500 acre-feet of water spilled past the Vermejo Conservancy District's headgate in the form of peak flood flows. In August and September of 1982, approximately 6,500 acre-feet were spilled. A total of 12,000 acre-feet of Vermejo River water was therefore contributed to the supply of users on the Canadian River in those two years alone. *See* Amended Narrative Tender of Evidence and Requested Findings of Fact and Conclusions of Law, at 6-9, 11.

Two conclusions can be drawn from these data. First, there is verifiable evidence of a substantial water contribution to the Canadian River from the Vermejo. This water directly

contributes to New Mexico's rights on the Canadian. Tr. 1044, 1131-32, 1670-1677. It was prejudicial error for the Master to exclude this evidence and to dismiss the Canadian users with rights in Vermejo water from the report. Secondly, the data from the two gauges show the difference between what Colorado has represented as available water supply and what is actually divertible. This will be discussed at greater length in Point III. The difference is apparent in N.M. Ex. Nos. F-56 and F-57 Revised, attached to New Mexico's Amended Narrative Tender of Evidence and Requested Findings of Fact and Conclusions of Law. These hydrographs clearly show the water actually diverted by the Vermejo Conservancy District in contrast to flows of the Vermejo River.

In responding to the Court's inquiry concerning the existing uses of Vermejo River water, New Mexico's Brief on Remand focused on the precise issue framed by the Court — whether current levels of use in New Mexico represent either historical water shortages or the failure of New Mexico water users to develop their uses diligently. 103 S. Ct. at 548-49. It was clear that by "existing uses" the Court did not mean simply the amount of currently irrigated acreage.³ 103 S. Ct. at 549. Instead, the Court was asking that each right be evaluated to determine whether any period of restricted use was caused by shortage or was attributable to lack of diligence. The Court was

³ If the Court had meant by "existing uses" the number of acres irrigated at present, New Mexico's burden would depend upon when the plaintiff elected to file suit. Had the case been filed in 1977, the plaintiff would have found 665 acres irrigated in the Vermejo Conservancy District. Had suit been filed in 1982, the plaintiff would have found 6,882 acres irrigated. U.S. Bureau of Reclamation Statistical Summary 1980-1982. On the one hand, New Mexico would have had to justify nonuse on 6,714 acres, and on the other the burden would have gone to only 497 acres. Consequently, we assume that the Court means by existing uses the amount of acreage which survives a balancing between historical water shortage and lack of diligence.

confirming that restricted use in times of shortage cannot be attributed to lack of diligence.⁴

At trial New Mexico presented evidence of the development of the Vermejo rights and related that evidence to hydrological evidence. Colorado presented no such evidence. Colorado's evidentiary analysis began in 1973. As to the extent of uses prior to 1973, Colorado's chief hydrologist admitted that he had "no information at all." Tr. 305.

⁴Under the law of prior appropriation in both Colorado and New Mexico, nonuse caused by circumstances beyond the control of the water right owner is excused. In *Chaves v. Gutierrez*, 54 N.M. 76, 213 P.2d 597 (1950), the New Mexico Supreme Court held:

It is true there were long intervals between 1913 and 1932, the period in which nonuse sufficient to constitute forfeiture is claimed to have occurred, when no irrigation of the lands in tract No. 8 actually took place. Nevertheless, the evidence is abundant that throughout such periods of nonuse, droughts producing a shortage of water, the progressively increasing depth and width of Chavez Canyon, which had its course across a portion of tract No. 8, all combined to render irrigation impractical or impossible. (54 N.M. at 82, 213 P.2d at 600).

The Court held that under those climatological conditions a forfeiture would not take place. *Id.* at 82, 213 P.2d at 600. This principle was affirmed in *State of New Mexico ex rel. Reynolds v. South Springs Co.*, 80 N.M. 144, 452 P.2d 478 (1969). New Mexico statutes recognize the unfairness in loss of a water right through nonuse where conditions beyond the control of the owner prevent use. See §72-12-8 (N.M.S.A. 1978).

The same is true of the other western jurisdictions. See *Rocky Ford Irrig. Co. v. Kents Lake Reservoir Co.*, 104 Utah 202, 135 P.2d 108 (1943); *Federal Land Bank v. Morris*, 112 Mont. 445, 116 P.2d 1007 (1941); *Scherck v. Nichols*, 55 Wyo. 4, 95 P.2d 74 (1939); *Gould v. Maricopa Canal Co.*, 8 Ariz. 429, 76 Pac. 598 (1904); *Yentzer v. Hemenway*, 440 P.2d 7 (Wyo. 1968). In each of these cases, a period of nonuse was excused for reasons beyond the control of the water right owner.

C. F. & I. Steel Corporation is familiar with this principle. In the case of *In re C. F. & I. Steel Corporation in Las Animas County*, 183 Colo. 135, 515 P.2d 456 (1973), C. F. & I. sought to excuse nonuse of 54 years.

The Master relied entirely on Colorado's fragmentary analysis. He provided no findings which would show the development of New Mexico's rights from the 1860s and the restriction of uses in the 1970s by successive years of below average flow. The Master refused to consider or evaluate the evidence on this point, referring frequently to New Mexico's "alleged drought." E.g., Report of May 31, 1983 at 11. The Master did not evaluate the actual water supply against the demand for that supply by the water users. As a consequence, his discussion of the rights on the Vermejo River encompasses no more than the last years of the 1970s, despite the history of uses from this river since 1867 and the extensive hydrological evidence introduced by New Mexico. In short, the Master did not attempt to make the findings requested by the Court.

New Mexico presented historical evidence of the development of rights on the Vermejo drawn from three sources: the hydrographic survey of 1927-28, the adjudication proceedings and decree in *Phelps Dodge Corp. v. W. S. Land and Cattle Co.*, No. 7201 (D. C. Cty. Colfax 1941), and testimony of the water users. The latter testimony extends from the 1920s to the present.

The hydrographic survey showed the extent of historically developed irrigation from the Vermejo River as of 1927-28 in a series of maps which identify the location and amount of irrigated acres, the cropping pattern, points of diversion, location of ditches, and other relevant factors. N.M. Ex. No. D-3. The hydrographic survey showed a total of 24,860.77 acres that had been developed for irrigation of which 17,181.13 acres were classified as cultivated and 7,679.64 acres were classified fallow. The irrigation development occurred at a time of reliable supply. This supply is confirmed by data on the water supply from adjacent river basins. See Tr. 1195, N.M. Ex. Nos. A-1, A-3, A-60 through A-79.

The acreage decreed in *Phelps Dodge Corp. v. W. S. Land and Cattle Co.*, No. 7201 (D. C. Cty. Colfax 1941) reflects the water supply of the later 1930s and early 1940s. A total of 17,386.75 irrigated acres was decreed.⁵ The difference between the total developed acreage found in the hydrographic survey, and the total adjudicated acreage (7,474.02 acres) is land that had been developed but was not recognized in the decree because of the Court's judgment that it had not been diligently developed.

New Mexico's hydrological evidence shows that in the 1950-1979 period, the Vermejo River produced only 60% of the water produced in the 25 year period prior to 1950. N.M. Ex. No. A-1, A-3, A-60 through A-79. In the 1970s, drought is revealed by

⁵ The decreed acreage was as follows:

<u>Water User</u>	<u>Acres Irrigated</u>
Southwest Land Co. (Present Owner: Vermejo Park Corp.)	801.00 (Tributaries) 870.20 (Mainstem)
Phelps Dodge Corp. Holland Duell (Present Owner: Eual Messick)	501.19 163.40
Josib Subat (Present Owner: Joe Pompeo)	101.50
John Caraglio (Present Owner: Ray Porter)	16.49
W. S. Land & Cattle Co. (Present Owner: Vermejo Park Corp.)	46.73
Guido Federici (Present Owner: Mrs. Sam LaRoe)	82.99
Tom Farmer (Present Owner: Mrs. Sam LaRoe)	181.70
Maxwell Irrigation Co. (Vermejo Conservancy District)	14,621.55
TOTAL	<u>17,386.75</u>

long periods of consecutive dry years. N.M. Ex. Nos. F-10, F-12, F-14. The two below average years of 1971-72 were followed by only one year of near average flow, 1973, and by five years of below average flow. Tr. 1179. This trend is particularly apparent on New Mexico Exhibit No. F-14. It was essential for the Special Master to consider this evidence to accurately provide the findings requested by the Court.

The findings that the Special Master did make for the individual users reflect his refusal to weigh the evidence in an analytical and objective manner. Prior to the record breaking flood of 1965 and the drought of the 1970s, the unrefuted evidence from the water users shows the extent of New Mexico's irrigation on the Vermejo. Subsequent to the rehabilitation of the Vermejo project in 1954, the irrigation consisted of 9,111.8 acres of land.⁶

For Vermejo Park, the Special Master concluded that "the number of acres actually being irrigated is between 200 and 250." Report of May 31, 1983 at 3. He discussed three elements of evidence in this regard: testimony of the New Mexico State Engineer that there is sufficient water for Vermejo Park to irrigate more than 250 acres, the Dawson gauge, and the fact that Vermejo Park has "other sources of irrigated lands." *Id.* In the first two instances, the Master has misapprehended the evidence.

⁶The evidence shows the following acreage to have been in irrigation or irrigation rotation in this period:

Vermejo Park Corporation	690.0
Phelps Dodge	450.0
Odom	264.7
Duell	163.4
Pompeo	101.5
R. Porter	16.5
Vermejo Park	46.7
Vermejo Conservancy District	<u>7,379.0</u>
TOTAL	9,111.8 acres

Irrigation rotation refers to lands temporarily out of cultivation for soil building purposes or placement of lands in the Soil Bank.

The State Engineer did not testify that there was generally enough water for Vermejo Park to irrigate more than 250 acres. His testimony was carefully qualified to reflect that Vermejo Park could have irrigated more acreage only in periods of adequate supply. Tr. 2427. He testified that the rights on the Vermejo have suffered severe and chronic shortage. Tr. 2430.

The Master's reliance upon "monthly and annual discharge of the Vermejo River near Dawson, New Mexico" cannot support the availability of water to the Vermejo Park Corporation. Report of May 31, 1983 at 3. The gauge is located several miles downstream from Vermejo Park's diversion works and measures intervening tributary inflows.

The Master writes that Vermejo Park Corporation has other sources of irrigated lands on "a completely different water system" and that the availability of this source is another factor in Vermejo Park's failure to fully develop the Vermejo water. *Id.* at 3-4. It is true that Vermejo Park Corporation has irrigated lands which receive water from the Cimarron River system, but that is completely irrelevant to this action. The Cimarron River system cannot supply water to the irrigated lands on the Vermejo River. Vermejo Park Corporation's lands irrigated from the Cimarron and the Vermejo River systems are part of the Corporation's total available ranch resources. Yet the Master states that Vermejo Park Corporation is primarily a hunting and fishing resort and implies that for this reason the Corporation has not diligently put to use all of the water available to it from the upper Vermejo River. *Id.* at 3. Despite this conclusion, the Master found that Vermejo Park had diligently developed its entire decreed acreage at its property on the lower Vermejo. *Id.* at 6. If the Master's conclusion is true, why would Vermejo Park exert an effort to use its Cimarron River and lower Vermejo water supplies and not its water rights on the upper Vermejo?

The Master disregarded the testimony of those most knowledgeable about Vermejo Park showing the diligent development of this irrigation prior to the early 1970s and the decreased water supply thereafter. Mr. Charlesworth is the chief officer of Vermejo Park. Tr. 2074. At the beginning of his employment in 1975 he undertook a comprehensive study of the irrigation potential at Vermejo Park. This study engaged an agronomist and geologist who examined all the ditches and fields on the mainstem Vermejo and the tributaries. Tr. 2061. Mr. Charlesworth's testimony on this question is significant because Colorado, and subsequently the Special Master, relied upon it for determining the "historically irrigated" or "diligently developed" acreage at Vermejo Park. However, they ignored the crux of his testimony:

It's quite obvious on Vermejo Park that sometime during the 60's there was a tremendous amount of more acreage irrigated than there is today due to the lack of water.

Q. How do you know that?

A. Well, when you drive down the Vermejo River and every field you see hay stacks of larger than this room you know it's obvious at one point in time there was a lot of hay stored in these areas. They wouldn't build a hay stack just for the exercise of it.

Q. Did the testimony you gave in your deposition purport to make a statement as to, "historically irrigated acres" or to discuss the amount of acres irrigated prior to the time when you came on in 1974?

A. No, sir. My deposition was referring only to the period of time since my employment with Vermejo Park Corporation. Tr. 2074.

The testimony best describing Vermejo Park's irrigation practices prior to Mr. Charlesworth's tenure is that of Mr. Armijo. Mr. Armijo is the foreman. Tr. 2121. His responsibilities include all of the activities necessary for successful irrigation including maintenance of the ditches, preparation of the fields, planting and harvesting. Tr. 2121. He has worked in agricultural positions all of his life. Tr. 2124. From his experience he is familiar with the flows of the Vermejo River. Tr. 2124. Mr. Armijo has worked on the Vermejo Park property for twenty years. Tr. 2122.

When he began his employment at Vermejo Park in the early 1960s he remembers approximately 700 acres under irrigation from the mainstem of the Vermejo. Tr. 2124. He identified the irrigated acreage under the various ditches:

(a) Shy Ditch	40 acres	
(b) Young Ditch	400 acres	
(c) Baca-Vigil Ditch	50 acres	
(d) Reed Ditch	40 acres	
(e) Montoya Ditch	60 acres	
(f) Torres Ditch	100 acres	
TOTAL	690 acres	Tr. 2124-26.

Mr. Armijo testified that in the early 1970s he observed a decrease in the level of flow in the Vermejo River. Tr. 2129-30. He testified that this occurred at a time of decreasing snowfall and precipitation. Tr. 2129. Mr. Armijo's testimony was unchallenged.

Both Mr. Charlesworth and Mr. Armijo testified that the deposition testimony relied upon by Colorado to fix Vermejo

Park's irrigated acreage at 250 acres historically could apply only to the period of drought in the 1970s. Tr. 2075, 2128, Mr. Charlesworth testified:

Q. I would like you to characterize the statement that appears in Colorado's Exhibit No. 6 from the standpoint of your deposition testimony.

Would you say that any interpretation or conclusion of your testimony on the effect that 200 acres was the historically irrigated amount of acreage on the Vermejo Park Corporation was a correct conclusion or an incorrect conclusion?

A. That is an incorrect conclusion. Tr. 2075.

In his testimony Mr. Charlesworth recounted his efforts to irrigate additional acreage at Vermejo Park. Mr. Charlesworth testified that Vermejo Park would irrigate the entire 870 acres of decreed rights on the mainstem Vermejo if water were available. Tr. 2080. The water supply is simply not present. Tr. 2078, 2116. This has been proven by experience. Although faced with shortage, Vermejo Park has attempted to irrigate more acreage each year. Tr. 2076, 2077-78, 2080, 2084, 2099, 2116-17.

Q. Why aren't you irrigating more acres?

A. [by Mr. Charlesworth] Well, as I have repeatedly stated, each year in a majority of the years since Pennzoil has owned Vermejo Park, since Vermejo Park bought the property, we have tried to develop additional acreage to grow the crops that are necessary for us.

We can get one watering on them, but the predictability of getting another watering on them or two more waterings on them is nearly impossible. It has proven impossible. Tr. 2077-78.

Although the Special Master stated that Vermejo Park's water use was "at best careless" and "not efficiently developed," he provided no findings to support that conclusion. The evidence shows that Vermejo Park undertakes a careful grooming and fertilization program for its fields. Tr. 2079. In addition, the Special Master has incorrectly stated that the water used by Vermejo Park comes only from one source, Ditch 13. This is not correct. Mr. Charlesworth testified that Vermejo Park utilizes a portable pump to divert water from the Vermejo River into other ditches serving the Corporation's irrigated acreage. Tr. 2117-18.

The Master's treatment of Kaiser Steel's rights is similarly misdirected. Early in the report he writes that "both Colorado and New Mexico are in agreement that one reason for the failure to fully develop the available water is the Kaiser mine at York Canyon." Report of May 31, 1983 at 4. He explains by stating that an average of 25% of Kaiser's necessary water is supplied from the York Canyon site, which he concludes is not directly on the Vermejo River and "should be unaffected by prior Vermejo River diversions." *Id.* at 4.

The Kaiser Steel Coal mine has two points of diversion from which it obtains its water supply. Diversion point A is an infiltration gallery, which is essentially a horizontal well buried in the alluvium of York Canyon. Tr. 1723. Diversion point B consists of pumps in the Vermejo River from which the water is pumped to the mine via a six inch pipeline. Tr. 1723. The confluence of York Canyon and the Vermejo River is below the location of diversion point B, so water that flows past diversion point A may not be diverted at diversion point B, contrary to the Master's discussion at page 26.

The Master states that Kaiser has lost its incentive to fully develop all of the available Vermejo River water. Report of

May 31, 1983 at 5. This statement is negated by Kaiser's installed pumping plant and pipeline to convey water from diversion point B on the Vermejo River to its York Canyon mine with a capacity of 530 gallons per minute. Tr. 1723, 1730. This installation will pump approximately 850 acre-feet per year which is more than adequate to pump the 630 acre-feet per year which is the limit of Kaiser's owned and leased rights to Vermejo River water. The testimony at the pages referenced by the Master shows that Kaiser has not diverted the full allotment of 630 acre-feet per year because of the ongoing development of the mine at York Canyon. The mine is not fully operational yet. Mr. Taylor specifically linked increased water usage to increased sales of coal. Tr. 1727. Rather than having "lost its incentive to fully develop all of the available Vermejo River water," Report of May 31, 1983 at 5, Kaiser requires this water for its expanding operations. Tr. 1724-1726.

Historically, *i.e.*, since the opening of the coal mine in 1966, an average of twenty-five percent (25%) of Kaiser's demand has been met from the York Canyon alluvium. However, during the first years of mine operation, up to 80% of the water supply was obtained from the New York Canyon alluvium. During the years immediately preceding the start of trial, this source supplied less than 10% of the total demand. N.M. Ex. No. D-6.

The reason for this decline in water yield is that there is generally insufficient recharge to provide a constant supply from the alluvium. The early depletion of this aquifer left little supply available for use in later years.

Mr. Taylor described this phenomenon as follows:

"Our experience is this country is very lenticular. That means there are no known aquifers of any great importance.

And so you pump out these areas very quickly and they have to be recharged rather quickly also by frequent rains or what have you, snowmelts. If they are not recharged, then there is no water available. Tr. 1735.

* * * *

It's important to keep in mind point A is a very intermittent supply. It can be pumped down very readily.

Q. I understand that. In some years you took 75 percent of your supply from the pumps?

A. But remember that was before we pumped down the limited aquifers in the area. Tr. 1744.

Kaiser has maintained its full water right under New Mexico law by securing extensions of time in which to apply the water to beneficial use. Tr. 1106. Such extensions of time are granted where the applicant can show that a diligent effort is being made to develop the water supply for the intended use. In the interim, water not used by Kaiser under its priority flows down the river to become a part of the supply currently available to the Vermejo Conservancy District, or, during low flow periods, to Phelps Dodge and the private users diverting from the district canal. The water not being used by Kaiser is *not unused* in New Mexico. The same is true for each of the appropriators from the Vermejo River. Water not currently being used by Vermejo Park Corporation flows downstream to the next user and this sequence may be repeated down to the Vermejo Conservancy District headgate. Within its capability to divert flows and the capability of its storage works, the Vermejo Conservancy District picks up all unused water from upstream appropriators. To the extent that the district cannot pick up the unused water, it flows on downstream into the Canadian and into Conchas Reservoir. Tr. 1331-32. Conchas Reservoir last spilled in 1965. Tr. 1376.

In 1963, the initial stage of Ute Reservoir was completed, providing a total reservoir capacity of about 110,000 acre-feet. In 1984, enlargement of Ute Reservoir will be completed, which will provide a conservation storage capacity of 200,000 acre-feet and a total storage capacity of 272,000 acre-feet.

With respect to acreage owned by the Phelps Dodge Corporation, the Master concluded that "up to 110 additional acres could have been irrigated without additional reclamation." Report of May 31, 1983 at 5. The source for this conclusion is given as the testimony of Mr. Jiggs Porter. However, Mr. Porter's complete testimony was that water was not available to irrigate the additional acreage:

Q. Is there any remaining land that was formerly irrigated to which water could physically be applied?

A. Yes, sir.

Q. How much in your estimation?

A. I think approximately a hundred ten acres, perhaps.

Q. Why is it this acreage is not being cultivated?

A. We just don't have adequate water for it. Tr. 2180.

Mr. Jiggs Porter was the principal witness for irrigation practices on the Phelps Dodge property. This land is currently leased to C S Cattle Co. Tr. 2141, 2163. Mr. Porter has been employed as the foreman for the C S Cattle Co. for 31 years. Tr. 2170. He has been familiar with the Phelps Dodge property at Dawson since 1935. Tr. 2172. He testified from personal knowledge and experience that Phelps Dodge irrigated between

450 and 500 acres until 1965. Tr. 2174-75. In that year, two events affected Phelps Dodge's irrigation capability — the flood of 1965 and the construction of a railroad over part of the property. Tr. 2175-76. The flood washed out some of the ditches and covered the land with debris. Tr. 2175. There was no practical means of applying water to land west of the river. Tr. 2175.

Mr. Porter testified that the flow of the Vermejo has decreased steadily in recent years. Tr. 2179. He testified that he is currently irrigating as many acres as can reasonably be expected to receive a supply of water. Tr. 2180.

Phelps Dodge's irrigation practices were confirmed by the president of C S Cattle, Mr. Leslie Davis. He testified that C S Cattle made an effort to relevel and reclaim fields that were washed away. Tr. 2164. He testified that, given the available water supply, C S was irrigating all that could be irrigated. Tr. 2164-65.

Phelps Dodge has substantial coal reserves on this property. Tr. 2154. The estimates range from one-half million tons to two million tons of salable coal per year. Tr. 2155. Approximately 600 employees would be required to mine it. Tr. 2155. Phelps Dodge has reserved the option to resume mining on the property and has undertaken an extensive program to evaluate feasibility. Tr. 2154-55. Water would be required for dust suppression, coal washing, and for domestic purposes. Tr. 2156. Estimates range from 220 to 900 acre-feet of water that would be required. Tr. 2157-58.

According to the Master, New Mexico would "reserve" 220-900 acre-feet of water which Phelps Dodge is not presently using. Report of May 31, 1983 at 6. He writes that New Mexico does not indicate there would be a problem should the extra water be needed. He says, "presumably it is presently available, unused."

Id. Contrary to the Master's presumption, all of the Vermejo River water supply is used by other New Mexico water users who would be deprived of that supply when Phelps Dodge requires it.

In this report the Master discusses the private water users diverting from the Vermejo Canal; Pompeo, Odom, Porter, Messick and Vermejo Park Corporation. *Id.* at 6-7. They were excluded from his first report. He finds that the two users having the largest acreage, Pompeo and Odom, have not been diligent and he allows them less than 50% of their decreed acreage while allowing two of the three other users the full amount of their decreed acreage. Then, inexplicably, he finds that Mr. Messick, the fifth user, is entitled to irrigate 88 acres of land. *Id.* at 7. This is factually impossible. Messick was left only 48 acres after the transfer to Kaiser.⁷ Tr. 1029.

The private users diverting from the Vermejo Canal testified to their water usage and to the effect of shortage on their farms. Mr. Pompeo has water rights appurtenant to 101.50 acres of land. He testified that there was insufficient water for him to currently irrigate more than 50 acres. Tr. 2201-02. He has unsuccessfully tried to irrigate more. Tr. 2203-04. Mr. Odom owns 264.69 acres of water rights. He testified that declining streamflow in the Vermejo River in the early 1970s caused him to reduce the amount of acres irrigated from the decreed 264 acres to 113 acres. Tr. 2211, 2213. He testified that if water were available, he would irrigate the full 264 acres today. Tr. 2214-15. Mr. Ray Porter irrigates approximately 16.5 acres. Vermejo Park irrigates 46.73 acres. Tr. 2110. Mr. Messick irrigates 48.4 acres. Tr. 1029. Thus, the total is 477.82 acres. All of the private users testified to their desire to continue farming and to leave their landholdings to their families. Tr. 2191-92, 2203-06, 2214-17.

⁷Correspondingly, Kaiser has been deprived of 80 acre-feet of water transferred from the original Messick right.

The Master finds that the Vermejo Conservancy District has not given top priority to development of its allotment of water from the Vermejo River because complete and diligent development does not appear essential, in part because of alternative sources and in part because of the inefficient and problematic operation of the District itself. Report of May 31, 1983 at 9. The Master makes this finding in the face of testimony by New Mexico witnesses that the Vermejo is the most dependable source of supply to the District and that the Vermejo provides 70% of the supply to the District with only 30% supplied from its other source, the Chico Rico. Tr. 1303. All of the District's reservoir storage capacity totalling approximately 22,600 acre-feet can be filled from the Vermejo. All of the 7,379 acres in the District can be served from the Vermejo source. However, only 7,400 acre-feet of the District's reservoir storage capacity can be filled from the Chico Rico and not all of the 7,379 acres can be reached with water from the Chico Rico. Tr. 1313. In addition, the Master does not understand the sources of supply available to the District. According to the Master, the Chico Rico provides about 35% of the District's water; and Willow, Crow, Curtis and Saltpeter Creeks may provide up to 10% of the water used by the District. Report of May 31, 1983 at 9. Saltpeter Creek is intercepted by the Vermejo Canal and its contribution is included in the 70% supply provided from the Vermejo source. Willow, Crow, and Curtis Creeks are intercepted by the Eagle Tail Canal, the District's canal from the Chico Rico, and their contribution is included in the estimated 30% supply provided from the Chico Rico source.

The Master incorrectly portrays the facts by stating that the Vermejo Conservancy District reservoirs primarily divert flows from the Chico Rico. *Id.* at 12. As shown by the above discussion, the converse is true.

The Vermejo Conservancy District has experienced severe shortages, especially since 1966. New Mexico Exhibit No. F-37 shows the extent of irrigated acreage in the District, together with the District's annual prorations. The total project acreage is 7,379 acres. A full water supply requires a ration of 1.5 acre-feet per acre. The following tabulation reflects historical prorations:

<u>Calendar Year</u>	<u>Annual Water Proration (Acre-Feet/Acre)</u>	<u>Irrigated Acreage</u>
1955	1.25	3763
1956	1.38	4941
1957 .....	.67	4276
1958	1.00	4602
1959	1.50	4693
1960 .....	.50	4592
1961	1.00	6436
1962	1.50	5869
1963 .....	.38	4344
1964 .....	.11	2349
1965	1.08	3218
1966 .....	.60	4114
1967 .....	.58	3902
1968 .....	.67	4720
1969 .....	.33	6294
1970 .....	.67	5559
1971 .....	.08	5094
1972 .....	.29	4912
1973 .....	.58	5083
1974 .....	.54	6262

<u>Calendar Year</u>	<u>Annual Water Proration (Acre-Feet/Acre)</u>	<u>Irrigated Acreage</u>
1975 .....	.25	5422
1976 .....	.05	2063
1977 .....	.00	665
1978 .....	.48	3016
1979 .....	.50	3398

See generally N.M. Ex. No. F-37.

The conclusion is obvious. From 1955 to 1965, which was the period during which the lands within the rehabilitated project were to have been redeveloped, the actual water supply fell short of a full supply of 1.50 acre-feet per acre each year but two. The supply dropped off radically in the 1970s.

With respect to the uses on the Canadian River, the water supply analysis contained in the Water Supply Study for the Tucumcari Project (N.M. Ex. No. C-3), shows that the water supply available to the Arch Hurley Conservancy District would have averaged 87 percent of the demand or an average annual shortage of 13 percent for the period studied. Tr. at 1368.

POINT III

THE MASTER'S DETERMINATION OF THE "AVAILABLE SUPPLY" OF WATER FROM THE VERMEJO IS ANALYTICALLY WORTHLESS TO THE COURT. HE USES A STANDARD EXPRESSLY REJECTED BY THE COURT, MISSES THE SIGNIFICANCE OF THE STREAM FLOW DATA, CONJURES UP CONSERVATION MEASURES NOT FOUND IN THE RECORD, AND CONCLUDES BY FINDING THAT SOME OF THE DEMAND FOR WATER ON THE VERMEJO CAN BE RELIEVED WITH SOME OF THE WATER ALREADY BEING USED.

The Special Master's treatment of the "available supply" shows that he doesn't understand the significance of the numbers he uses to conclude that "there is an adequate water supply to satisfy the needs of all users." Report of May 31, 1983 at 21. The Master approaches the matter in two ways. First, effectively disregarding the guidelines set by the Court in previous equitable apportionment actions, the Master adopts average annual flow as his standard of determining availability and concludes that "even an average of 10,900 acre feet at Dawson gauge would seem to provide a fair amount of available water, and more than enough to supply the current uses below the gauge." *Id.* at 11. He reaches this supposition notwithstanding the undisputed fact that the amount of water that would be needed each year to satisfy what he terms "the current uses" is 11,400 acre-feet.⁸ Secondly, applying a novel standard of water availability to the actual gauged flows of the Vermejo for the period 1916-1979, the Master concludes that "even looking at each individual month and each individual year, there does not exist a situation where

⁸ It should be noted that the Master's concept of "current uses" completely excludes the Canadian rights and reduces the Vermejo uses below the Dawson gauge by 3,315 acres.

supply is 'intermittent' or 'materially deficient' . . . " *Id.* Oblivious to the import of the figures to which he refers, the Master reaches this conclusion when the figures unquestionably prove the opposite.

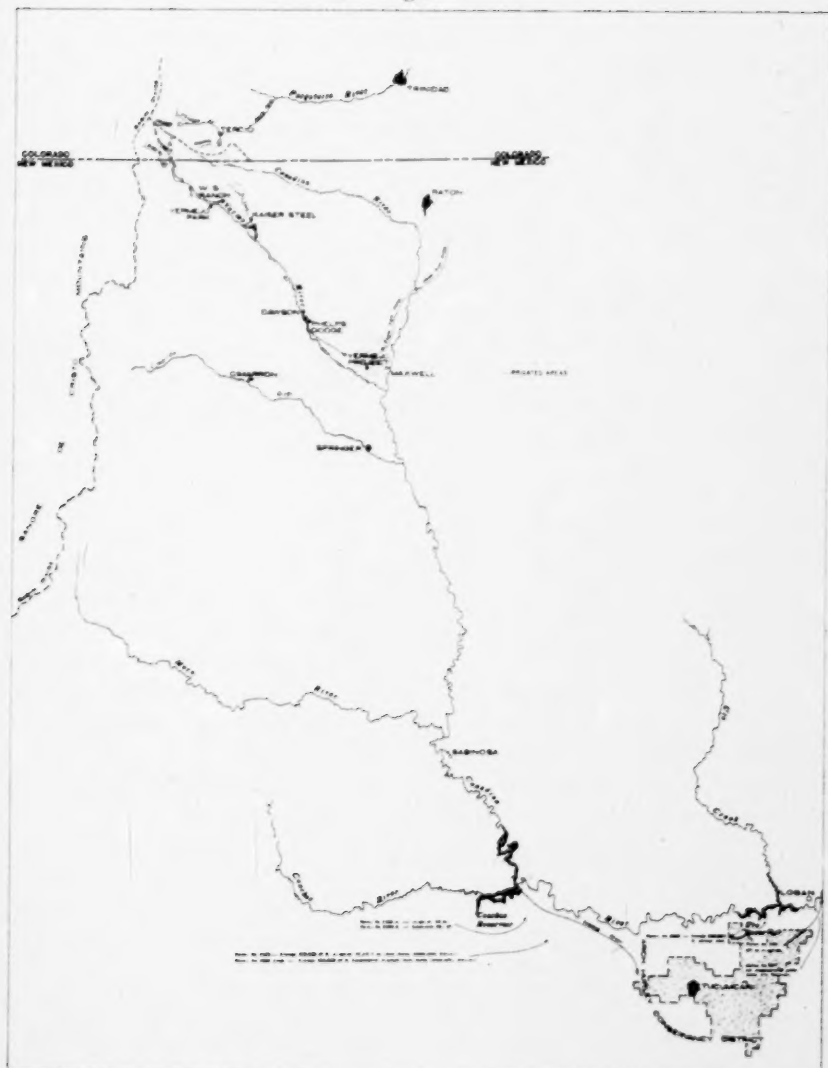
To understand what the Master has done, the Court will recall that the Dawson gauge is a U.S.G.S. gauge located on the Vermejo River just above Phelps Dodge's point of diversion. See Figure 1. The Dawson gauge has been recording the flows of the Vermejo since 1916, and until 1977 it was the only gauge on the river. It is this gauge which provided the data appearing in the appendix to the Master's report entitled Table 2. It should also be noted that the gauge is upstream from the Vermejo Conservancy District's point of diversion and that the gauged flows, in the Master's mind, are indicative of the supplies "available" to the District historically.⁹

It is agreed between Colorado and New Mexico "that the effect of the Colorado diversion would essentially be felt in its entirety by the Vermejo Conservancy District. . . ." ¹⁰ Brief of the State of Colorado Pursuant to Special Master's Order of December 20, 1982 at 52. Accordingly, in order to assess the Master's findings with regard to supply from the Vermejo, the Court must know the demand for water downstream from the Dawson gauge, *i.e.*, the water requirement in acre feet needed to supply Phelps Dodge, the Vermejo Conservancy District, and the private users who divert from the Vermejo Canal. As will become

⁹ The Court should also note that the Eagle Tail Canal is the District's diversion canal from Chico Rico Creek on the east side of the District. The supply available to the District from the Chico Rico is not discussed by the Master, but is discussed herein below.

¹⁰ Colorado has represented that New Mexico agrees that the adverse effect on the District would be the only adverse impact on New Mexico. As is discussed in detail in Point VI, however, the undisputed evidence proves that all Vermejo users would be injured in low flow years and that the Canadian River users of Vermejo water would be injured in high flow years. The District would be injured in every year.

Figure 1



apparent, the Master did not consider the demand when he surmised that an average of 10,900 acre feet "would seem to provide a fair amount of water. . . ." Report of May 31, 1983 at 11.

Calculating the amount of water needed to satisfy the diligently developed entitlement of the New Mexico users below Dawson, the record shows the demand to be 17,000 acre-feet.¹¹ Calculating the same requirement for the New Mexico entitlement as reduced by the Master for "lack of diligence," the demand at Dawson is 11,400 acre per annum.

Because neither the State of New Mexico, the Bureau of Reclamation, nor Congress could convince the Master that the Vermejo has been plagued by drought since 1950 and especially in the 1970s, he concluded that the reduced amount of acreage that was irrigated during the drought periods must have resulted from lack of interest on the part of New Mexico's farmers. Report of May 31, 1983 at 9. Consequently, he cut the Vermejo Conservancy District down to its average since 1955, *i.e.*, 4,379 acres, the private users from 476 acres to 312 acres, and Phelps Dodge from 301 acres to 150 acres. Had he actually assessed the supply in relation to even this reduced demand, however, he could not reasonably have concluded either that the supply was not materially deficient or that there has been no drought.

¹¹ The District's farm delivery requirement is 1.5 acre-feet per acre per annum, which results in a need for 11,100 acre-feet when multiplied by 7,379 acres. Adding a 37.5% loss from the reservoirs to the farms, results in a demand of 17,800. Tr. 1315. Because only 70% of the supply comes from the Vermejo, however, the demand is reduced to 12,400 acre-feet. Tr. 1303. Adding reservoir evaporation produces a required reservoir inflow of 14,700 acre-feet. Tr. 1286.

The private users' farm delivery requirement is 2.0 acre-feet, which produces a need for 952 acre-feet when multiplied by 476 acres. The total demand of the District and the private users is 15,650 acre-feet. In order to know the demand at the Dawson gauge, inflow between the gauge and the Vermejo Canal must be subtracted (800 acre-feet), Tr. 1406, canal loss added (1700 acre-feet), Tr. 1280, and Phelps Dodge's depletion (400 acre-feet) added, resulting in demand at Dawson of 17,000 acre-feet.

Looking at Table 2 in the Report of May 31, 1983, the five year period 1950-1954 shows an aggregate annual water supply at Dawson gauge of 22,100 acre-feet; the total demand for the same 5 year period was 85,000 acre-feet. Inexplicably, the deficit was not a drought period in the Master's mind. For the period 1950-1979, Table 2 shows a total supply of 297,720 acre-feet against a demand of 510,000 acre-feet. The Master views the deficit of 212,280 acre-feet as a plus.

Assuming as the Master did that the entire flow at Dawson is divertible, which it is not, the supply and demand was as follows:

<u>Year</u>	<u>Supply at Dawson Gauge</u>	<u>Demand at Dawson Gauge for Full Acreage</u>	<u>Surplus (+) or Shortage (-) of Supply</u>
1950	5,400	a.f. 17,000	-11,600
1951	1,480	17,000	-15,520
1952	6,210	17,000	-10,790
1953	5,710	17,000	-11,290
1954	3,340	17,000	-13,660
1955	24,930	17,000	+ 7,930
1956	3,360	17,000	-13,640
1957	16,140	17,000	- 860
1958	27,260	17,000	+10,260
1959	6,160	17,000	-10,840
(Total 50-59)....	(99,990)	(170,000)	(-70,010)
1960	5,890	17,000	-11,110
1961	19,910	17,000	+ 2,910
1962	12,920	17,000	- 4,080
1963	5,600	17,000	-11,400
1964	3,730	17,000	-13,270
1965	23,010	17,000	+ 6,010
1966	10,080	17,000	- 6,920
1967	8,440	17,000	- 8,560

<u>Year</u>	<u>Supply at Dawson Gauge</u>	<u>Demand at Dawson Gage for Full Acreage</u>	<u>Surplus (+) or Shortage (-) of Supply</u>
1968	14,380	17,000	- 2,620
1969	11,150	17,000	- 5,850
(Total 60-69)....	(115,110)	(170,000)	(-54,890)
1970	13,030	17,000	- 3,970
1971	5,660	17,000	-11,340
1972	4,680	17,000	-12,320
1973	12,920	17,000	- 4,080
1974	3,040	17,000	-13,960
1975	7,530	17,000	- 9,470
1976	6,640	17,000	-10,360
1977	7,900	17,000	- 9,100
1978	8,650	17,000	- 8,350
1979	12,570	17,000	- 4,430
(Total 70-79)....	(82,620)	(170,000)	(-87,380)
Total All Years..	297,720 ¹²	510,000 ¹³	-212,280

While these comparative figures illustrate how the Master purported to reach the "specific findings" in his report, it should be obvious to anyone that the figures don't support the Master's conclusions. On the contrary, they fly in the face of the Master's conclusions. In the 1970s, which is the period Colorado used to argue that the New Mexico entitlement should be radically reduced because of alleged lack of diligence, the demand was not met in any year. While the numbers show the drought the New Mexico experts, the Bureau of Reclamation officials, the water users, and Congress have recognized, the Master blinds himself

¹² These figures are taken from Table 2 in the Master's Report of May 31, 1983.

¹³ The demand shown is adjusted to account for the fact that the Chico Rico source furnishes approximately 30% of the Project water supply.

to their significance. Having set out to balance supply and demand, the Master did so without taking cognizance of the demand.

Conversely, the Master failed to correctly evaluate the supply. The Master found that the supply at the Dawson gauge, *i.e.*, 10,900 acre-feet on the average, was "more than enough" to supply all of the rights below the gauge, neglecting the Chico Rico and other non-Vermejo tributaries, which satisfy 30% of the demand. Taking into account the Chico Rico supply, as the above numbers do, the chronic and substantial shortages reflected by these figures are still experienced.

It is clear from an actual comparison of supply and demand that the Master should have concluded that water shortage prevented the full development of the irrigated acreage below the Dawson gauge. The Master concluded that the New Mexico users were not diligent even though the failure to irrigate the full entitlement was beyond their control. Accordingly, he reduced the District's entitlement to 4,379 acres from 7,379 acres, the private users from 476 acres to 312 acres, and Phelps Dodge from 301 acres to 150 acres. Thus blaming the users for an act of God, the Master concluded that the average of 10,900 acre-feet on the Vermejo was more than enough to satisfy the reduced "current uses." If the Court were to adopt *both* of the Master's erroneous premises, however, he is still grossly wrong. The following tabulation contrasts the supply at Dawson, albeit not fully divertible, with the demand for the Master's severely abbreviated New Mexico entitlement:

Water Year	Annual Discharge Vermejo River Near Dawson	Demand at Dawson Gauge for Reduced Acreage	Surplus (+) or Shortage (-) of Supply
1950	5,400	11,400	- 6,000
1951	1,480	11,400	- 9,920
1952	6,210	11,400	- 5,190
1953	5,710	11,400	- 5,690
1954	3,340	11,400	- 8,060
1955	24,930	11,400	+13,530
1956	3,360	11,400	- 8,040
1957	16,140	11,400	+ 4,740
1958	27,260	11,400	+15,860
1959	6,160	11,400	- 5,240
(Total 50-59)	(99,990)	(114,000)	(-14,010)
1960	5,890	11,400	- 5,510
1961	19,910	11,400	+ 8,510
1962	12,920	11,400	+ 1,520
1963	5,600	11,400	- 5,800
1964	3,730	11,400	- 7,670
1965	23,010	11,400	+11,610
1966	10,080	11,400	- 1,320
1967	8,440	11,400	- 2,960
1968	14,380	11,400	+ 2,980
1969	11,150	11,400	- 250
(Total 60-69)	(115,110)	(114,000)	(+ 1,110)
1970	13,030	11,400	+ 1,630
1971	5,660	11,400	- 5,740
1972	4,680	11,400	- 6,720
1973	12,920	11,400	+ 1,520
1974	3,040	11,400	- 8,360
1975	7,530	11,400	- 3,870
1976	6,640	11,400	- 4,760
1977	7,900	11,400	- 3,500
1978	8,650	11,400	- 2,750
1979	12,570	11,400	+ 1,170
(Total 70-79)	(82,620)	(114,000)	(-31,380)
Total All Years ..	297,720	342,000	-44,280

Adopting the Master's faulty premises, *i.e.*, using basin discharge as opposed to divertible flow to supply two thirds of the valid uses instead of the diligently developed entitlement, the Master still has an aggregate deficit of 44,280 acre-feet, with sustained deficient supplies in the 1950s, intermittent supplies in the 1960s, and prolonged, profound deficiencies in the 1970s. To the Master these figures reveal a consistent, positive supply.

New Mexico's essential objection to the Special Master's two reports in this case goes to the Master's inability to appreciate the significance of the evidence he expressly relies on. Our objection, however, also goes to the fact that the Master entirely disregards other evidence. With regard to the available supply, for instance, the record shows the actual prorations of water to the Vermejo Conservancy District's farms. A full ration of water is 1.5 acre-feet per acre. During the drought of the 1970s the prorations were:

<u>Calendar Year</u>	<u>Annual Water Proration (Acre-Feet/Acre)</u>
1970.....	.67
1971.....	.08
1972.....	.29
1973.....	.58
1974.....	.54
1975.....	.25
1976.....	.05
1977.....	.00
1978.....	.48
1979.....	.50

See generally N.M. Ex. No. F-37.

These figures comport with the supply and demand figures above. The Master, however, chose to ignore them.

Because of the way in which the Master elected to analyze the available supply, *i.e.*, by looking at annual average flows on the one hand and actual annual and monthly flows on the other, the above discussion analyzes the supply as if all of the water at the Dawson gauge were divertible in each year, which it is not. Assuming that it were, the Master's figures prove the opposite of what he concludes. To make matters worse, however, the Court has specifically rejected the methodology utilized by the Master, which we have followed in the above analysis to show that he is grossly in error even when he doesn't distinguish between basin discharge and divertible flows.

Early in equitable apportionment litigation, the Court perceived that average flows are necessarily inflated by flood flows which are not divertible. *Wyoming v. Colorado*, 259 U.S. 419, 471, 476 (1922); *Colorado v. Kansas*, 320 U.S. 383, 396-97 (1943). The principle is critical to the instant case. For example, over the 52 year period of record, 1927-1978, 1,900 acre-feet or 15% of the average annual flow of 12,800 acre-feet in the Vermejo River is attributable to the floods of 1941 and 1942. Tr. 1178; N.M. Ex. No. F-10. More importantly, however, as to each individual year the total flow for the year or for individual months is not helpful in explaining whether that amount of water was divertible, let alone divertible at the times needed for irrigation. Tr. 1198. Accordingly, the Court has held that the critical inquiry is into:

the amount of *divertible* flow at times when water is most needed for irrigation. Calculations of average annual flow, which include flood flows, are, therefore, not helpful in ascertaining the dependable supply of water usable for irrigation. *Colorado v. Kansas*, 320 U.S. at 397 (emphasis added).

The distinction is between "divertible flow" during the irrigation season and "average annual flow," the latter of which will not disclose whether the water was there when it was needed.

The point was emphasized further in *Wyoming v. Colorado*:

Colorado's evidence, which for convenience we take up first, is directed to showing the average yearly flow of all years in a considerable period, as if that constituted a proper measure of the available supply. We think it is not a proper measure. This is because of the great variation in the flow. . . . 259 U.S. at 471.

* * *

... [T]he average of all years is far from being a proper or safe measure of the available supply. An intending irrigator . . . based on such a measure would be almost certainly confronted with drought when his need for water was greatest. Crops cannot be grown on expectations of average flows which do not come, nor on recollections of unusual flows which have passed down the stream in prior years. Only when the water is actually applied does the soil respond. 259 U.S. at 476.

The Special Master recognized that "[i]t is true that the guidelines set forth in *Wyoming v. Colorado* are appropriate and should be applied in this case." Report of May 31, 1983 at 10. Instead of applying the express guidelines of "divertible flow" and "dependable supply," however, the Master tried to create different guidelines. He makes reference to the following paragraph concluding the Court's discussion in *Wyoming v. Colorado*'s misuse of averages:

But we are of opinion that the computations and conclusions of the witness, even when revised in the way we

have indicated, are based too much on the average flow, and not enough on the unalterable need for a supply which is fairly constant and dependable, or is susceptible of being made so by storage and conservation within practicable limits. By this it is not meant that known conditions must be such as give assurance that there will be no deficiency even during long periods, but rather that a supply which is likely to be intermittent, or to be materially deficient at relatively short intervals, does not meet the test of practical availability. 259 U.S. at 480.

Noting that averages "can be used to reach nearly any result," the Special Master surmises that "looking at each individual month and each individual year, there does not exist a situation where supply is 'intermittent' and 'materially deficient at short intervals.'" ¹⁴ Report of May 31, 1983 at 11. While it is apparent from the supply and demand figures shown above that the supply on the Vermejo is not only intermittent and materially deficient at short intervals, it is also apparent that it has been materially deficient for long periods of time. For instance, in the five year period 1950-1954, the demand at the Dawson gauge was 85,000 acre-feet while the aggregate supply was only 22,100 acre-feet. During the two year period 1963-64, the demand was 34,000 acre-feet and the supply was 9,330 acre-feet. For the period 1971-1978, the worst of the post-1950 drought years, the demand was 136,000 acre-feet and the supply was 57,000 acre-feet. Because the Master, however, apparently did not have the demand in mind, he did not see the deficiencies.

It is obvious that the Master did not understand the significance of the methods and figures he used to determine

¹⁴ New Mexico testified that the Court's criticism of averages could not be overcome unless a daily study were done of flow and demand. Tr. 1178. For the period 1950-1979, however, the analysis need not be so precise in order to determine that the supply has been materially deficient.

available supply. He also ignored the telling testimony of Colorado's expert witness, Mr. Helton. Mr. Helton admitted that the use of average annual figures obscured flood flows and peak runoff. Tr. 395. He admitted that "most of the water is produced by rainstorms." Tr. 417. He testified further that Colorado made no analysis to determine whether the water was available in a realistic sense, no analysis of how much average runoff could have been intercepted by the water users, and no analysis of how and when the water arrived at the Vermejo Conservancy District's headgate. Tr. 419, 422. Following this line of questioning on cross-examination, Mr. Helton reiterated the fact that when Colorado is talking about "water available at the diversion points," it is not talking about divertible water. Tr. 423. Concluding the subject on cross-examination, he could not say anything about the ability of the water users to divert water without analyzing when and how the water got to the diversion points. Tr. 424. Colorado's own witness, in other words, conceded that Colorado never intended to present the water supply evidence that the Court has specifically asked for in *Colorado v. New Mexico*. 103 S.Ct. at 548-549. Under the law of this case, as well as the previous equitable apportionment cases, Colorado not only has not met its burden, but never tried to. See, e.g., *Wyoming v. Colorado* at 471, 476; *Colorado v. Kansas* at 396-97.

While Colorado's evidence says nothing about true availability, New Mexico's expert witnesses, Bureau of Reclamation officials, and the water users themselves testified from detailed studies and experience as opposed to speculation that the river has not supplied the existing demand historically.¹⁵

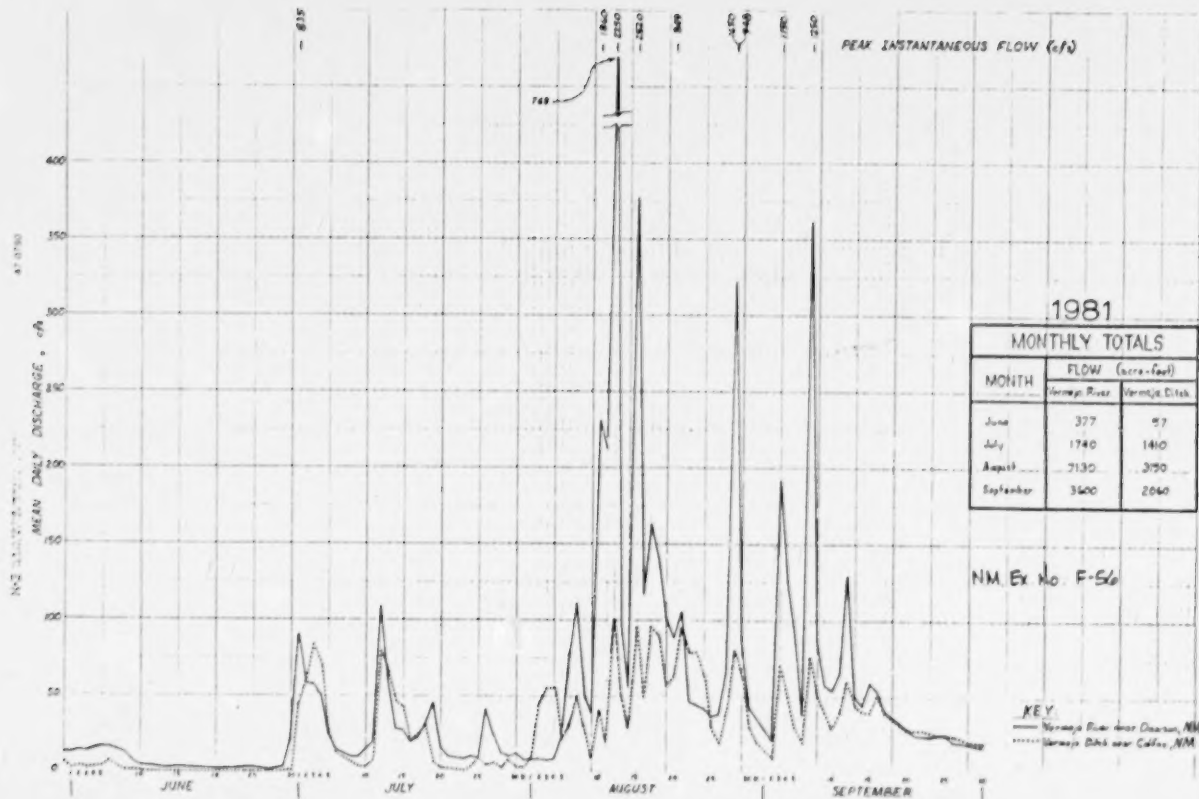
¹⁵ In November, 1980, Congress considered H.R. 8298, which was designed to relieve the Vermejo Conservancy District's repayment obligation arising out of the project's rehabilitation. As described by Representative Lujan, the legislation "relieves [the District] of its repayment obligation to the United States until such time as the money becomes available. . . since the quantity of

As the Court itself has done twice, New Mexico's principal expert witness, Mr. Mutz, explained that the difference of opinion between Colorado and New Mexico lies in the fact that Colorado did not attempt to analyze divertible supply and that the Court cannot use average annual discharge to assess what has been available to the water users. Mr. Mutz testified that you could not reasonably use average annual or monthly figures to study the amount of water that is actually available to the District or to other users. Tr. 1136, 1188-90. To further make his point, Mr. Mutz prepared a flow duration curve of the Vermejo River based on mean daily flow records. Tr. 1188; N.M. Ex. No. F-18. The flow duration curve proves, without room for dispute, that the dependable water supply cannot be determined from average annual or monthly stream flows. Tr. 1188; *see also* N.M. Ex. No. F-12.

Perhaps the most illustrative examples in the record of the Court's view that averages reflect flood flows and inflate the actually available supply are the hydrographs that we tendered in evidence to compare the flows at the Dawson gauge, which include flood flows, with the flows in the Vermejo Canal, which have recently become known by the U.S.G.S.'s installation of a gauge. The hydrographs compared mean daily discharge, which as Mr. Mutz testified, produce the level of analysis needed to know whether the monthly or annual flows are in fact divertible. *See, e.g.*, N.M. Ex. No. F-56.

At trial there was conflicting evidence relating to the amount of water spilling past the Vermejo Conservancy District's headgate. Water spilling past the District's headgate flows on down the Vermejo River into the Canadian River and is a part of

water that was to have been available to irrigate the crops has consistently fallen extremely short." 126 Cong. Rec. H 11183 (daily ed. Nov. 21, 1980) (Statement of Rep. Lujan). It should be pointed out that the first draft of the legislation would have permanently excused the debt. The act that was finally passed, however, temporarily relieved repayment on the theory that the drought cycle would change. The water supply of the last two years would appear to justify Congress' decision.



the supply available to New Mexico users on that stream. The largest of those users is Arch Hurley Conservancy District whose water supply has been 13% short historically. Tr. 1368-78. There were also conflicting contentions as to the amount of water divertible by the Vermejo Conservancy District. Colorado asserted that the District's diversion structures are capable of diverting the entire flow of the Vermejo River.

At the beginning of trial, a gauge was installed on the Vermejo Conservancy District's Vermejo canal just above Stubblefield Reservoir, the first served by the canal. The gauge was installed and is operated by the U.S.G.S. The records for the years 1981 and 1982, which were not available until after trial, show that in August and September of 1981 approximately 5,500 acre-feet spilled past the Vermejo Conservancy District's diversions in the form of peak flows, and in August and September of 1982 approximately 6,500 acre-feet spilled; a total of approximately 12,000 acre-feet of Vermejo River water was thus contributed to the supply of the Canadian River below the Vermejo Project in these two years. The records also show that during the period June through September, 1981 and May through September, 1982, the discharge of the Vermejo River at the Dawson gauge totalled 26,710 acre-feet and the discharge in the Vermejo Canal, *i.e.*, the amount of water at the Dawson gauge that was actually divertible by the Vermejo Canal, was 12,490 acre-feet; 2,220 acre-feet of depletion occurred between the Dawson gauge and the Vermejo Canal gauge and 12,000 acre-feet spilled past the Vermejo Conservancy District's diversion works during the periods of short duration flood flows.

Experts are not needed to read the hydrographs. On August 9, 1981, for example, in N.M. Ex. No. F-56 the Court can see the flood on the Vermejo. While it started to subside during the evening of the 9th, a greater flood occurred on the 10th. The graph shows that things returned to normal by the 13th, only to

be greeted by another major flood on the 14th. Essentially all of the water between the dotted lines and the solid lines in the hydrograph is flood flow obscured in the monthly flow figures at the Dawson gauge, which cannot be diverted by the Vermejo Conservancy District. It is part of the water that flows past the District's diversion structures into the Canadian River, where it is captured and regulated for beneficial use in Conchas and Ute Reservoirs. While adding unquestionable proof that the Vermejo River is not the closed system the Master has told the Court it is, where "very little, if any, water escapes from the diversion works of the Vermejo Conservancy District" (Report of December 31, 1981 at 4), the hydrographs also vividly show that average monthly and annual flows are not all divertible. The hydrographs disprove the Master's erroneous findings and vindicate the position taken by New Mexico all along.

The Special Master's discussion of alternative sources of water supply is directly contradicted by all the evidence in the record. Without understanding that the sources to which he refers are at a great distance from the Vermejo or have been fully used historically and can in no way relieve the demand on the Vermejo, the Master states that "Vermejo Park Corporation, Kaiser and the Vermejo Conservancy District all have other water sources." Report of May 31, 1983 at 17. What the Master fails to understand is that these "other sources" are not sources of new water to relieve the demand on the Vermejo, but rather are sources that are now and have been fully used.

For example, for the Vermejo Park Corporation the Master states that there was "testimony indicating other sources of irrigated lands . . . , sources dependent on 'a completely different water system.'" Report of May 31, 1983 at 3. His reference is to the fact that Vermejo Park owns some hay producing lands on the Cimarron River. No explanation is offered of any relation

between the Vermejo and the Cimarron, and none exists. The Master may as well have found that Vermejo Park owns irrigated land on the Potomac.

The Master's finding respecting the Vermejo Conservancy District is even more untenable:

One major alternative source is the Chico Rico providing approximately 35% of the District's water. Other sources include the Willow, Crow, Curtis and Salt Peter Creeks. They may provide up to 10% of the water used by the District. *Obviously, development of the entire allotment of water from the Vermejo is not a top priority in the District. Complete and diligent development does not appear to be essential, in part because of alternative sources . . .*" Report of May 31, 1983 at 8-9 (emphasis added).

The Master's logic is contradictory. The "alternative sources" to which he refers are part of the historical supply to the District. It is no secret that the District has two points of diversion, one on the Vermejo and one on the Chico Rico. They are part of the works that provide the existing, deficient supply. That the Master can somehow find this fact cogent in the context of the Court's request for specific findings relating to alternative sources of supply is inexplicable.

The evidence reveals no alternative source of supply for any of the existing uses of Vermejo water. Tr. 1183, 1331, 1752-1803; N.M. Ex. No. F-18. The Bureau of Reclamation studies made in relation to the rehabilitation of the Vermejo Conservancy District, confirmed by private consultants, concluded that there are no economically feasible reservoir sites to regulate the surface supply and no alternative ground water sources. Tr. 1353-55. Studies undertaken by Vermejo Park Corporation and Kaiser Steel Corporation also establish that there is no

appreciable ground water storage along or near the Vermejo and that there are no aquifers of any importance in the area. Tr. 1735, 2089. A New Mexico geohydrologist testified that "alternative sources of water are for practical purposes not available." Tr. 1795. None of this testimony was questioned, much less impeached or rebutted.

Colorado presented no evidence on this question but suggested the possibility of alternative sources of supply for the City of Raton and Kaiser. According to Colorado, 3,000 acre-feet of San Juan-Chama water is available for use by Raton. The San Juan-Chama Project water, however, is Colorado River water made available under New Mexico's entitlement in the Upper Colorado River Compact. Tr. 2440. In order for that water to be used in Raton, Rio Grande water originating in the headwaters of the Red River, a tributary of the Rio Grande, would have to be taken transmountain to Eagle Nest Lake and then piped some 60 miles to Raton. Colorado put on no evidence of the economic or physical feasibility of such a project. In fact, a lower cost alternative has been undertaken. The Master made no findings of fact on economic or physical feasibility either, as the Court requested. 103 S. Ct. at 546.

With respect to Kaiser, Colorado tried to suggest that Kaiser's rights to some 800 acre-feet of water from the Cimarron River, some 50 miles from the York Canyon mine, could be used as an alternate supply. Tr. 1728. Mr. Taylor, the engineer in charge of coal operations for Kaiser, testified that such a project would not be economically feasible and that the alternative was to shut down. Tr. 1731-32. Colorado also attempted to suggest that Kaiser could operate its mine using its York Canyon diversion in lieu of its Vermejo River diversion. Tr. 1743. Mr. Taylor explained that the York Canyon ground water supply was "very intermittent." Tr. 1744-45. Elsewhere, it was testified that the York Canyon supply would be pumped out in a couple of days if Kaiser were forced to rely on it. Tr. 1451.

The Master's treatment of the other factors listed by the Court as relevant to the available supply of Vermejo water is equally vacuous. With regard to the needs of the existing New Mexico users for a continuous supply the Master reached the pointless conclusion that "the only user with a need for a continuous supply of water is Kaiser; the other users engaged in irrigation, requiring water approximately four to five months out of the year." Report of May 31, 1982 at 16. The Master misses the point. The need for a continuous supply does not go to whether a given water user irrigates five months out of the year or twelve months out of the year, but rather to the fact that the users cannot depend upon flood flows in one year which don't materialize in another. *See generally, Wyoming v. Colorado*, 259 U.S. at 471-76. In this regard, the Master made no findings at all, thus complementing his acceptance of average annual flows as a demonstration of his obliviousness to streamflow variation.

Similarly, with regard to the possibility of enhancing the supply through regulation, the Master unperceptively states that "the Vermejo Conservancy has a reservoir system" Report of May 31, 1983 at 17. As discussed in Point VI, however, the Vermejo has historically provided no carryover water to conserve. Colorado put on no evidence in this regard, and the Master made no inquiry into the feasibility or practicability of any reservoir project. Forgetting the unimpeached evidence that there are no economically feasible reservoir sites to regulate Vermejo waters (Tr. 1353-55), the Master posits the inconsequential fact that the District has a system of reservoirs. This represents the extent of the Master's analysis of this aspect of available supply.

The final area in which the Master erroneously finds that water might be conserved is through "administration." In reality, this is no finding at all, but rather is a statement of a totally unfounded conclusion which will be discussed in detail in Point IV.

In conclusion, the Master's analysis of the available supply of water is fatuous. Instead of attempting to learn from the evidence the amount of Vermejo water actually divertible by the New Mexico users, the Master irrationally adopts average annual flows as his measure of available supply. He then looks at the figures and not only fails to comprehend their significance, but arrives at a conclusion which is diametrically opposed to what the figures unquestionably show. The Master then proceeds to adjust the "available" supply by finding that "with proper conservation measures, there is an adequate water supply to satisfy the needs of all users." Report of May 31, 1983 at 21. He does so without identifying the conservation measures or discussing their feasibility. Finally, the Master finds that the demand for water on the Vermejo can be relieved with some of the water already used, a contradiction in physics which apparently eludes him. In short, the Master's treatment of available water supply is hopelessly inadequate. While the Master reaches conclusions adverse to New Mexico, he is not able to justify them with reason or fact.

POINT IV

THE MASTER'S FAILURE TO CONSIDER THE EVIDENCE AND TO MAKE SPECIFIC FINDINGS REGARDING THE STATES' RESPONSIBILITIES TO CONSERVE WATER IS COMPLETELY UNRESPONSIVE TO THE COURT'S MANDATE.

The Special Master's treatment of the extent to which reasonable conservation measures in both states might eliminate waste or inefficiency reveals the Master's double standard. On the one hand, the Master states that "it is not for the Master or for New Mexico to say that reasonable attempts to conserve water will not be implemented by Colorado." Report of May 31,

1983 at 21. On the other hand, he commands that "reuse should be developed" for stockwater in New Mexico! *Id.* at 18. No reference is made to the relevant evidence and no specific findings are made. Indeed, evidence bearing directly on this issue was excluded by the Master when he refused to consider New Mexico's analysis of use of water from stockwater ponds. See Motion to Receive Evidence, March 5, 1983; Amended Narrative Tender of Evidence and Requested Findings of Fact and Conclusions of Law, at 4-6. The Master simply rambles on about an undefined, generalized need for conservation, suggesting that "perhaps" New Mexico could do this and "perhaps" it could do that. Report of May 31, 1983 at 19. In a word, the Master's treatment of conservation measures is entirely conjectural.

The law concerning the duty to conserve the waters of an interstate stream is clear. The requirement is one of "conservation within practicable limits . . ." *Wyoming v. Colorado*, 259 U.S. 419, 484 (1921). This qualification was reaffirmed in the first phase of this case: "the extent of the duty to conserve that may be placed upon the user is limited to measures that are 'financially and physically feasible.'" 103 S. Ct. at 546, 550.

Conservation is undertaken to solve one of two problems: waste or inefficiency. Waste and inefficiency are distinct terms of art. To waste water is to expend it needlessly, either willfully or through neglect. It is a species of tort. See, e.g., §72-8-4 (N.M.S.A. 1978). In every western state, including New Mexico and Colorado, the concept of waste does not include the unavoidable loss of water incident to its application to beneficial use. *Stroup v. Frank A. Hubbell Co.*, 27 N.M. 35, 192 P. 519 (1920); *Combs v. Agricultural Ditch Co.*, 17 Col. 146, 28 P. 966 (1892). In this case, Colorado mistakenly used the concept of waste interchangeably with inefficiency. The Master accepted

this confusion of terms without any effort to independently examine the facts or to correct Colorado's misapplication of the terms. Used properly, the term waste has no relevance to the Vermejo River water users. Colorado presented no evidence of waste by any user in the Vermejo or Canadian River systems.

Like waste, inefficiency is a term of art. It is a function of uniformity of distribution, the slope of the lands, evaporation, leakage from storage and distribution systems, as well as climate and porosity of soils. The efficiency of an irrigation project can be improved by changing the nature of the project works, e.g., by lining ditches, installing pipelines, or building reservoirs to regulate flows. The efficiency of a farm can be improved by installing drip or sprinkler irrigation systems, by improved irrigation practices, or by leveling of irrigated lands. Climatological conditions and porosity of soils cannot be changed. To the extent that inefficiency is a function of these conditions, man has no control over it.

Irrigation efficiency is defined as "the percentage of applied irrigation water that is available for consumptive use." N.M. Ex. No. E-2. When measured at the farm headgate, it is called farm irrigation efficiency; when measured at the field it is designated field irrigation efficiency; and when measured at the point of diversion, it may be called project efficiency. See American Society of Civil Engineers, *Consumptive Use of Water and Irrigation Water Requirements*, pp. 54-61, N.M. Ex. No. D-2, p. 5.

To understand the superficiality of the Master's treatment of conservation, the Court must be made aware of the relevant evidence in the record, none of which is referenced or weighed by the Master. The Court must also know that Colorado's case respecting conservation was nothing more than unfounded innuendo and accusation, none of which was supported by fact.

Conservation by the Vermejo Conservancy District

District Efficiency and Conservation Measures

In a nutshell, the Master originally proposed that the Court make water available to C. F. & I. by performing a mercy killing of the Vermejo Conservancy District because, in his view, it "has never been an economically feasible operation." Report of December 31, 1981 at 23. The Master reiterated his conclusion in his Additional Factual Findings:

At the heart of New Mexico's water problem is the Vermejo Conservancy District. Whether lack of administration, lack of diligence, lack of resources or lack of ability is the cause, there is little doubt that the District has failed as a water reclamation project and has serious financial and operational problems of its own. (Tr. 164-169). Several of the conservation problems already discussed are present in the District. Furthermore, there is a problem of loss through evaporation in the District's seven reservoirs. (Tr. 863, 1296-1299). The District has a 32% efficiency to farm headgates and an overall system efficiency of 24.6%. (Tr. 2576). New Mexico claims that the District falls in the middle range in reclamation project efficiencies. (Tr. 1410-1411). However, the existence of other low efficiency systems is not justification for failure to fully develop water sources here. Report of May 31, 1983 at 20.

The significance of the fact that the District falls in the middle range of reclamation project efficiencies eludes the Master. Regional practice is the best evidence of practicability. One wonders how the Master can impose a Utopian standard of excellence on New Mexico and the Bureau of Reclamation and no standard on Colorado without recognizing the contradiction and the inherent double standard that it represents.

The Master's reliance on Colorado's arguments is misplaced. Early in trial Colorado generalized about the efficiency of the Vermejo Conservancy District. Colorado's expert, Mr. Helton, testified that "the Conservancy District tends to operate five reservoirs when one or possibly two would suffice." Tr. 239. He also stated that the District could "easily offset the effects of the Colorado diversions" by "implementing reasonable management practices." Tr. 240. Without suggesting what conservation measures might be undertaken, except for the installation of a closed stockwatering system, Mr. Helton concluded that "through some management technique or change in the Vermejo headgate [the District could] improve [its] overall system efficiency from 32.92 to 40%." Tr. 242. A similar obligation was thought appropriate for the District's individual farmers. With no indication of how they might do so, Mr. Helton explained that they should "improve their on-the-farm efficiency [from 50%] to 70%." Tr. 243. Colorado's witness concluded that these efficiencies "are well within the range we could reasonably expect could be achieved by the Conservancy District." Tr. 244.

When it came time to prove its assertions, Colorado failed. Mr. Helton explained that the Vermejo Conservancy District could have used "all" of the average watershed discharge of 18,888 acre-feet by the "installation of a domestic water system...system improvement...[and] some better management techniques..." Tr. 503. When asked specifically what improvements could be made, Mr. Helton responded: "Sir, I have not done that kind of an in-depth study. I have not done a study, as a matter of fact, at all." Tr. 504. When asked how these unspecified conservation measures would be financed, Mr. Helton could offer "no recommendation..." Tr. 504. When asked whether new structures or reservoirs could be built to retain and regulate flood flows in which downstream users had vested rights, Mr. Helton did not deem the downstream rights "relevant." Tr. 303, 280-300. At a different point in his

testimony he admitted that under Colorado law the Canadian River users would have a vested right in flood flows from the Vermejo. Tr. 428.

In contrast to Mr. Helton's testimony, Mr. Mutz explained that the Vermejo Conservancy District is not being operated inefficiently and that there are no practicable or financially feasible conservation measures available to the District's farmers. With respect to the project efficiency of the District, Mr. Mutz testified that the 60 miles of canals in the Vermejo Conservancy District are not at all uncommon in reclamation projects. Tr. 1312. Mr. Mutz also testified that the Vermejo Conservancy District is utilizing its reservoirs as efficiently as possible. Tr. 1363. Similarly, the official of the Bureau of Reclamation responsible for the operation of the Vermejo Conservancy District, Richard Ochs, testified that any inability in the District to maintain diversion or delivery works has been caused by water shortage, not imprudent irrigation practices. Tr. 1628.

With respect to the feasibility of conservation measures, Mr. Mutz explained that no water user can design diversion works and canals that would intercept peak flows.¹⁶ Tr. 1296. The Bureau of Reclamation investigated the possibility of reservoir storage on both the Vermejo and the Chico Rico drainages for the Vermejo Conservancy District and found that no additional supply could be developed that was economically feasible. N.M. Ex. No. C-1, C-2, Tr. 1350-55. The Vermejo Conservancy

¹⁶ The peak flows are depicted graphically in tendered N.M. Ex. No. F-56, at p. 50, above. On August 15, 1982, for example, the flow at the Dawson gauge increased 3,400 cfs in less than two hours. The Vermejo Canal diverted only about 135 acre-feet on August 15, and about 810 acre-feet spilled past the diversion into the Canadian. These flood flows are captured and regulated in Conchas and Ute Reservoirs downstream. It is absurd to think that the District should be required to build a diversion dam and conveyance works capable of diverting such flows.

District could not afford either the capital cost of installing sprinkler systems or the annual cost of energy to pressurize the sprinklers. Tr. 1362. Mr. Ochs testified that Colorado's suggestion that the Vermejo Conservancy District could make improvements in efficiency by reasonable conservation measures was unfounded. Tr. 1628. He testified that it is not economically feasible for the Vermejo Conservancy District to undertake to modify its diversion works to more efficiently divert water or to increase the amount of water divertible. Tr. 1594. Colorado did not question this testimony.

In contrast to Mr. Helton's unfounded and unsupported suggestion that the District could operate "one or possibly two" reservoirs instead of five, Mr. Ochs explained that the District officials were operating the District's reservoirs as efficiently as possible and that all of the reservoirs were needed to serve the District's lands. Tr. 239, 1638. He explained that the District's farmers do not waste or spill water that could be used on their farms. Tr. 1660. None of Mr. Ochs' testimony with regard to efficiency was questioned, much less impeached on cross-examination. *See also*, Tr. 1363, 1950.

On rebuttal Colorado neither attacked nor disproved any of the testimony of the New Mexico officials, the Bureau of Reclamation officials, or the New Mexico water users regarding efficiency. Tr. 2549-2674. Although Colorado argued that the Vermejo Conservancy District was "extremely inefficient," Colorado could not dispute that there are many irrigation projects with efficiencies in the range of the District's. Tr. 2576, 1410.

On surrebuttal Mr. Mutz showed that the efficiency of the Vermejo Conservancy District is 54%, discounting off-stream evaporation loss. Tr. 2719. New Mexico Exhibit No. F-50 is a tabulation of federal reclamation projects, showing their efficiencies. The Vermejo Conservancy District falls in the

middle of the range of efficiencies. Tr. 2721. Most of the reclamation projects tabulated in New Mexico Exhibit No. F-50 have on-stream reservoir storage. Tr. 2721. Evaporation from on-stream reservoirs is not accounted when computing project efficiency. If reservoir evaporation were added into the computation of efficiency for all of the projects in this exhibit, the project efficiency of the Vermejo Conservancy District would still compare favorably. Tr. 2721-27.

In a final attempt to undermine the fact that the overall efficiency of the Vermejo Conservancy District of 33% compares favorably with many western reclamation projects, Colorado attempted on cross-examination to distinguish between projects with on-stream reservoir storage and off-stream reservoir storage. Tr. 2730-46. Mr. Mutz's responses, however, clearly showed that the distinction is illogical. Reservoir evaporation is a necessary incident to providing water for beneficial use whether the reservoir is on-stream or off-stream and must be excluded or included consistently in making comparisons. Tr. 2727. The Rio Grande Project, as an example, loses over 100,000 acre-feet a year from an on-stream reservoir. Tr. 2739. Either way the Master compares efficiencies — including or excluding reservoir evaporation — the unimpeached evidence shows that the Vermejo Conservancy District falls well within a common, acceptable range. The overall efficiency of 33% is within the range of 30%-40%, within which numerous irrigation projects fall. Tr. 1410. The project efficiency of 54% falls in the middle of the projects tabulated in New Mexico Exhibit No. F-50. Tr. 2721.

While Colorado could not establish that the project efficiency of the Vermejo Conservancy District was inordinately low, its attempt to do so would not have been dispositive in any event. As reiterated in *Colorado v. New Mexico*, the standard used to determine whether a proposed conservation measure is

reasonable is whether it is "financially and physically feasible." 103 S. Ct. at 546; *cf.*, *Wyoming v. Colorado*, 259 U.S. at 484. In this regard, Colorado presented no evidence. Tr. 66-632, 2549-2701. Even if it were assumed that a particular irrigation project had a low efficiency, that fact would not indicate whether the local farmers could manage to increase the efficiency. The law did not deter the Master, however:

New Mexico argues that Colorado has merely pointed out areas of inefficient water use without making viable suggestions which would reduce or eliminate the inefficiency. It is the opinion of the Master that New Mexico's inefficient water use should not be charged to Colorado. Report on May 31, 1983 at 20.

In the Master's opinion, New Mexico must improve efficiency notwithstanding the fact that it is unreasonable or impracticable to do so. By contrast, the Master is of the opinion that "it is not for [him] or for New Mexico to say that reasonable attempts to conserve water will not be implemented by Colorado." *Id.* at 21.

The Closed Domestic/Stockwater System

Perhaps in recognition that the evidence shows that the project efficiency of the Vermejo Conservancy District is not inordinately low, that Colorado could suggest no specific improvements, and that no attempt was made to analyze whether any conservation measure was financially and physically feasible, Colorado focused its attention on the District's domestic and stockwater system. Justice O'Connor noted that the District had employed an engineering firm to investigate the feasibility of constructing a closed system to deliver domestic and stockwater to the District's landowners. 103 S. Ct. at 550, n. 2. New Mexico's evidence showed that if the District were to install an underground pipe system instead of utilizing the 60 mile network

of open canals to deliver stockwater, especially in the winter months, some 1,935 acre-feet lost through seepage and evaporation could be saved for irrigation. N.M. Ex. No. E-3, p. 18.

The closed system is now a reality. The issue raised by Colorado is not whether it could have been built, but whether it will conserve enough water to facilitate a new use in Colorado. The evidence shows that the water saved by the closed system will provide irrigation water for the Vermejo Conservancy District but that the water salvaged will not fully satisfy its demands. According to the standard reiterated by the Court in *Colorado v. New Mexico*, the new stockwater system will not "facilitate Colorado's proposed uses." 103 S. Ct. at 546. It is not a conservation measure which "might offset the proposed Colorado diversion" because it could not begin to offset the proposed diversion until the existing requirements for water in New Mexico are satisfied. 103 S. Ct. at 547.

The history of the closed system illustrates the diligence of the Conservancy District's farmers. In order to investigate the possibility of constructing a closed stockwater system, the Maxwell Cooperative Water Users Association was formed about ten years ago, long before this lawsuit was contemplated. Tr. 2762. In the decree in *Phelps Dodge Corp. v. W.S. Land and Cattle Co.*, No. 7201 (D.C.Cty. Colfax 1941), the individual farmers living near Maxwell were adjudicated stock and domestic rights. N.M. Ex. No. G-2. Originally, water was diverted at the District headgate, run through the system canals to the individual farms, and diverted into cisterns for domestic use. Tr. 2773. At the time, this method of distribution was the only method available to the District's farmers. The local ground water supply is inadequate in both quantity and quality for even domestic wells, and the Water User Association's initial attempt to produce water from a community well failed for lack of supply. N.M. Ex. No. E-3, Tr. 1437.

After the Maxwell Cooperative Water Users Association was formed, the Association applied to every conceivable private, state, and federal agency to obtain loan or grant money to finance the pipeline project. Tr. 2768. Leonard Knox, Jr., the president of the Maxwell Cooperative Water Users Association and member of the board of directors of the Vermejo Conservancy District, testified that the primary reason they undertook to build a closed system was because they had experienced historical shortages for irrigation and they believed the water thus conserved would help alleviate the shortage. Tr. 2765. After a painstaking effort, the Association was able to obtain a grant from the Agricultural Stabilization and Conservation Service and to borrow \$546,884.93 from the Farmers' Home Administration. Tr. 2763-70.

Commissioned by the Maxwell Cooperative Association, using funds provided by the State of New Mexico, the Dennis Engineering Company Report demonstrated that a closed system could conserve nearly 2,000 acre-feet annually. N.M. Ex.No. E-3. Once the funding was obtained, the job was let to J.R. Hale Construction Company of Albuquerque. In February, 1983, the project was completed. Two wells were drilled in the alluvium next to the Vermejo River. Water rights were transferred to the new point of diversion. Forty-eight miles of pipeline were laid three feet underground, and a 60,000 gallon storage tank was installed. After 10 years of effort and persistence, the first meter was installed on February 18, 1983. See Amended Narrative Tender of Evidence and Requested Findings of Fact and Conclusions of Law, at 4-6.

The last release of stockwater through the Vermejo Conservancy District's canals was on October 15, 1982. As was testified by New Mexico's witnesses at trial, the farmers in the District intend to apply the water conserved by the new system to their lands. Tr. 2766. Even Mr. Helton, Colorado's principal

witness, testified that the Conservancy District farmers had worked for years to fund the closed stock watering system. Tr. 2672.

The records of the Vermejo Conservancy District show that its farmers have received a full proration of water only two years out of the 25 years since the beginning of the operation. N.M. Ex. No. F-37. Based upon actual experience, the New Mexico water users testified to historical shortage. Tr. 1810-12, 2124, 2127, 2178, 2179, 2214. The Bureau of Reclamation concurred with the New Mexico users. Tr. 1548. Both the Bureau's Regional Director and the engineer responsible for the Vermejo Project operation personally observed the shortage of supply over the years. Tr. 1548, 1627. Congress recognized the shortage when it passed legislation temporarily relieving the District of its repayment obligation. Act of December 19, 1980, 94 Stat. 3221. New Mexico's expert witness also testified that chronic shortages have existed. Tr. 1135-36, 1305-10. *See* Point II. Even Mr. Helton recognized that the Conservancy District farmers would have irrigated more land historically if they had had the water supply. Tr. 2671.

The evidence shows unequivocally that the 1,935 acre-feet of water hoped to be conserved by the closed stockwater system is needed to relieve present shortages. Tr. 1362; *cf.*, Point II. The evidence also shows that the water thus conserved will not give the Vermejo Conservancy District a full irrigation supply. Tr. 1439. Accordingly, the water saved by the closed system cannot "offset" a proposed diversion in Colorado. As testified by the Bureau of Reclamation officials, any award of this water to Colorado would further exacerbate the current shortage to legitimate demand in New Mexico. Tr. 1554, 1653.

In light of the facts, the Special Master weighs no equities and makes no findings. Instead, he contradicts himself and concludes that there is more than enough water for everyone:

As for major projects concerning water conservation, New Mexico is to be commended. A closed stockwater system has been completed since the start of this trial. The effort to provide funding and construction has been considerable. Users of the system hope to conserve nearly 2,000 acre-feet of water. (Defendants' Brief on Remand, pp. 43-45). There seems little point in further discussion of the benefits of a closed system. *The system exists and its benefits are to be felt by New Mexico users.* New Mexico claims, however, that the water conserved by the system is needed by New Mexico users. The Master is of the opinion that based on the evidence in its entirety, there is already sufficient water if New Mexico would take every opportunity to develop their resources fully. With proper conservation measures, there is an adequate supply to satisfy the needs of all users. Report of May 31, 1983 at 20-21 (emphasis added).

In the same breath, the Master allows New Mexicans to enjoy the benefits of their labors and then gives the water conserved to C. F. & I. He then turns back to the bewildered New Mexicans and explains that everything will be alright because it's within their power to get blood out of a turnip. The Master should have addressed the legal and equitable basis of depriving people who have incurred a substantial financial obligation to conserve water of the benefits of their labors. On the one hand, the Master congratulates the District's farmers for having undertaken initiatives to conserve water and then recommends stripping them of the water conserved because "there seems little point in further discussion of the benefits of a closed system." *Id.* at 20.

Conservation by the State of New Mexico

Administration

Colorado's argument that the State of New Mexico can conserve water to offset a proposed diversion in Colorado was contrived. First, it was asserted that there is no water right

administration on the Vermejo River which might "promote beneficial use, eliminate waste, and conserve the water supply." Reply Brief of the State of Colorado, May 7, 1982, at 54. Secondly, Colorado asserted that an "uncontrolled multiplication of water detention dams, fishponds and stockwater ponds deprive the [Vermejo Conservancy] District of its full share of water" ¹⁷ *Id.* at 54. The theory is that the State of New Mexico should administer priorities, declare unspecified Vermejo rights forfeited or abandoned, and eliminate the stockponds in the Vermejo drainage. These "conservation measures," Colorado urged, will augment the water supply to facilitate C. F. & I.'s proposed use.

While Colorado never explained how administration could conserve water, the Master concluded that "[a]side from major projects which would improve the conservation of Vermejo River water, the most important element is administration." ¹⁸ Report of May 31, 1983 at 18. The Master made no factual finding to support his conclusion.

In an attempt to denigrate New Mexico water law, Colorado argued that "New Mexico follows a practice of no surveillance of water usage unless . . . they receive complaints," while Colorado "maintains a constant surveillance during the irrigation season" Post Hearing Brief at 33. In all of the 18 arid or semi-arid western states the state water administrator, usually called the state engineer, is responsible for the administration and distribution of the waters of the state. *See, e.g.,* Colo. Rev. Stat. §37-80-102 (1973) and §72-2-9 (N.M.S.A. 1978). In all of these states except Colorado, however, an intending appropriator

¹⁷ The Court should note that Colorado inadvertently recognizes the historical shortage to the Vermejo Conservancy District in some of its arguments.

¹⁸ The "major projects" that should be undertaken in New Mexico are a figment of the Master's imagination. They aren't to be found in the record.

cannot acquire a usufruct in public waters until the State Engineer first finds that water is available to appropriate and then issues a permit. *See, e.g.,* §72-5-1 and §72-12-3 (N.M.S.A. 1978). The effect of these restrictions on new appropriations is twofold. They shift the burden of proof to the intending appropriator to show that his appropriation will not impair existing water rights and they tend to limit the new appropriations to the amount of water realistically available. By contrast, Colorado does not govern new appropriations, but rather allows unending rights to appropriate its streams and rivers. Tr. 604.

The proliferation of water rights in Colorado that has resulted from the absence of governmental control over new appropriations is illustrated by Colorado Exhibit No. 14-5 and the testimony of Dr. Danielson, the Colorado State Engineer, who stated that demand exceeds the supply on the Purgatoire 99.5% of the time. Tr. 534. Stated differently, "at least 50 percent of the time, [the Purgatoire] is overappropriated 800 percent." Tr. 537.

As explained by New Mexico's witnesses, there is ordinarily no need for constant governmental surveillance of water use in New Mexico. *E.g.,* Tr. 1063-64, 2416-17. While drought and shortage may make life difficult for water users, it is our experience that they can and do govern themselves. Tr. 2416-17. When administrative intervention is needed, however, New Mexico law is more than adequate.

Supervision of apportionment of water in accordance with licenses and court decrees is vested in the State Engineer. §72-2-9 (N.M.S.A. 1978). He may create or change water districts from time to time when necessary. §72-3-1 (N.M.S.A. 1978). Upon written application of a majority of water users in a water district, the State Engineer appoints a watermaster who has immediate charge over the

apportionment of water (under the general supervision of the Engineer) and he shall so apportion, regulate, and control the waters as to prevent waste. In the absence of such an application, the State Engineer may appoint a watermaster for either temporary or permanent service if local conditions require it. § 72-3-2 (N.M.S.A. 1978). The watermasters are to report such information to the State Engineer as he may require, such as the adequacy or inadequacy of the water supply, and the State Engineer shall correct any errors of apportionments as may be needed. §72-3-5 (N.M.S.A. 1978). During the existence of an emergency, and only during such time, he may employ assistants to serve under a watermaster. §72-3-4 (N.M.S.A. 1978). Any person may appeal from the acts, or decisions of a watermaster to the State Engineer and thence to the district court. §72-3-3 (N.M.S.A. 1978). 2 W. A. Hutchins, *Water Rights Laws in the Nineteen Western States*, 528 (1974).

Intervention in the form of a watermaster has not been needed on the Vermejo River. However, water rights administration by the State of New Mexico in many important respects has extended to the Vermejo since 1907. All appropriations of ground and surface water can be made only after application to the State Engineer and following statutory notice and hearing procedures. Similarly, all changes in point of diversion or place and purpose of use, like that undertaken by Kaiser Steel, can be effected only by application, notice and hearing. The State Engineer also supervises the construction of dam and reservoir structures and has undertaken and completed a program of water right adjudication in the area. Tr. 2417. More importantly, however, with regard to the priority administration that Colorado has represented would result in savings, Colorado put on no evidence to show how such administration could make water available for its proposed new use, and the Special Master

has made no corresponding finding that it would result in any savings. Factually, administration could not conserve Vermejo water, and priority administration would do nothing but confirm historical shortage. It makes no difference which of the New Mexico users take the short supply first; they are all senior to C. F. & I. by nearly 100 years.

On the Vermejo River, the first appropriator is the Vermejo Park Corporation. The lands irrigated are adjacent to the Vermejo River. There is no opportunity for waste because there are no swamps, seeped lands, or areas into which water could be diverted and wasted. Any water diverted and not consumed by the crops returns to the stream system as return flow. Any water not diverted by Vermejo Park under its priority and return flows from the corporation's diversions simply proceed downstream to the next diverter on the Vermejo. There is no conservation opportunity through administration.

The next user is Kaiser Steel Corporation which diverts from the Vermejo River and from York Canyon into a closed system. Meters are installed on both diversion points. Under its permit from the state, Kaiser must return a minimum of 25% of the diverted water through a metered point of return to the Vermejo system. Kaiser reports monthly to the State on its diversions and return flows. If Kaiser does not divert water from the Vermejo River in accordance with its priority, the water, along with Kaiser's return flows, proceeds downstream to the next diverter on the river. There is no opportunity for conservation through administration.

The third point of diversion is the Phelps Dodge Corporation. The lands irrigated by this diversion are adjacent to the river; water diverted and not consumed by the crops readily finds its way back to the river system as return flow. The only water loss results from seepage in the return flow channels to the river,

which returns to the stream. Any water not diverted in accordance with the Phelps Dodge priority, along with Phelps Dodge's return flows, proceeds downstream to the next diversion. There is no conservation opportunity through administration.

The last diversion on the river is Vermejo Canal which serves all of the remaining users, except the Canadian users who receive the flood flows. The Vermejo Canal diversion is operated by the Vermejo Conservancy District which employs a full-time staff whose duties include the diversion from the river, distribution and delivery of water to the individual water users in the District, as well as the operation and maintenance of the District's facilities. Deliveries of water are strictly prorated. The administration of the water diverted by the Vermejo Canal, which serves most of the users on the Vermejo River, is performed down to delivery to the users, which is much more administration than occurs in Colorado.

The private users' diversions from the Vermejo Canal are also monitored by the District. Mr. Pompeo and Mr. Odom, the two principal private users, have meters on their diversions. Tr. 1911, 1972. Any water not diverted by the five private users in accordance with their priority flows on down the canal to the District's supply. Any water not diverted from the Vermejo by the Vermejo Canal flows downstream into the Canadian River and into Conchas Reservoir which has a conservation storage capacity of 270,000 acre-feet to serve the Arch Hurley Conservancy District. In the event that Conchas Reservoir spills, Ute Reservoir, which is in the process of being enlarged to have a conservation capacity of 200,000 acre-feet, can capture and conserve the spill. These two Canadian River reservoirs provide the ultimate conservation measure for water spilling past the Vermejo Canal diversion. Accordingly, administration of priorities by the State of New Mexico would not conserve water or promote water use development.

Colorado also argued that New Mexico officials take no action under our forfeiture statute or our abandonment law until complaints are received and that "[t] his inaction is in the face of substantial evidence that rights on the Vermejo have been abandoned, as well as evidence of periods of nonuse." Post Hearing Brief at 34. As a matter of law, Colorado's assertion was nonsense. The "substantial evidence" of abandonment consisted of two documents, a memorandum from an employee of the Water Rights Division of the State Engineer Office to the State Engineer relating to the transfer from Eual Messick to Kaiser Steel of 230 acre-feet of water right (Colo. Ex. No. 49) and the complaint in *City Of Raton v. Vermejo Conservancy District*, No. 80-77 (D.C. Cty. Colfax 1980). Colo. Ex. No. 29.

Neither document indicates or remotely suggests an intent to abandon. The memorandum resulted from a routine field inspection of water rights proposed to be transferred. While the authors concluded that part of the rights appurtenant to the Messick land appeared to have been unused, the issue was subsequently tried before the State Engineer. See Application No. 10872, N.M. State Engineer Office, N.M. Ex.No. G-11. Evidence was adduced on the question, and it was found that the facts did not support the conclusion that rights had been forfeited. On appeal, the administrative decision was upheld. *W.S. Ranch Co. v. Kaiser Steel Corporation*, 79 N.M. 65, 439 P.2d 714 (1968).

The other half of Colorado's contention of forfeiture or abandonment in New Mexico consists of paragraph 8 of the complaint in *City of Raton v. Vermejo Conservancy District*, an action seeking a declaration that the District has no right to call priority on certain Chico Rico waters. The City of Raton allegation reads: "The defendant has abandoned and forfeited, through non-use, the right to call upon the plaintiff for the right for waters originating above the reservoirs belonging to the plaintiff." In other words, Colorado's substantial evidence is an

unsubstantiated allegation in a complaint. Since trial in this case, the *City of Raton* case was heard before the district court of Colfax County. In its Judgment of December 9, 1982, the district court held that the Vermejo Conservancy District was not barred or estopped from exercising its rights on the Chico Rico stream system by priority call or otherwise. The district court also awarded water to the District stored out of priority by Raton.

While there is thus *no* evidence of abandonment or forfeiture in the record, Colorado's briefs are replete with unsupported innuendo and scandalous suggestion that rights have been lost on the Vermejo. Contrasting Colorado's procedure to New Mexico's alleged inaction, Colorado asserts that "[Dr. Danielson's] office has recently declared some 650 water rights abandoned in the Arkansas River Basin, with 35 of these being in the Purgatoire River Basin." Post Hearing Brief at 34. The record shows that the Colorado State Engineer has no authority to "declare" water rights abandoned and that the list of which Dr. Danielson was speaking was not compiled until 1978 and is "yet to go to adjudication." Tr. 610; *see generally*, Tr. 562-65.

Contrary to Colorado's statement that 35 water rights have been abandoned on the Purgatoire, Dr. Danielson testified on cross-examination that "[a] water right can only be abandoned by the water court, and only after facts have been established and the intent proven that the right was really intended to be abandoned." Tr. 609. The evidence shows that the list to which Dr. Danielson referred was originally compiled in 1972, was revised in 1974, and was revised again in 1978. Tr. 611. As the record also shows, the nonuse occurring on the Vermejo since the early 1970s has been the result of drought conditions testified to by New Mexico's experts, Bureau of Reclamation officials, and each of the users on the river. *See* Points II and III. These conditions necessarily preclude a finding of intent to abandon

because they are beyond the control of the water users. Under the law of every western state, nonuse caused by shortage cannot be attributed to lack of diligence or an intent to abandon. *See, e.g., In re C. F. & I. Steel Corporation in Las Animas County*, 183 Colo. 135, 515 P.2d 456 (1973).

Stockponds

At the commencement of the trial of this case in December of 1980, Colorado introduced into evidence certain documents from the United States Bureau of Reclamation files. Colo. Ex. Nos. 37, 38, 40, 43, 44, 45, 58, each of which repeats or alludes to a single statement made by a Vermejo Conservancy District official to the effect that stockponds were depleting the District's supply and causing the shortage. Colorado argued that these documents establish that a primary cause of shortages of Vermejo River water in the Vermejo Conservancy District results from "unregulated" water detention dams.¹⁹ The depletion of Vermejo River water caused by these structures is variously described as "significant" and "major," although no specific amounts of water are ever stated in the exhibits or in Colorado's briefs. The location of these offending structures with respect to the District's diversion dam on the Vermejo is nowhere stated in any of the documents. It is assumed that structures are within the Vermejo watershed although the documents are silent as to this point also.

No attempt was made by Colorado to verify the statement contained in these exhibits. The number and location of the stockponds is not indicated in the exhibits, and the amount of water is nowhere quantified. Colorado did not independently present quantitative evidence on the number of stockponds or their effect on the Vermejo River.

¹⁹ Again, Colorado inadvertently recognizes the shortages that it maintains don't exist.

New Mexico objected during trial to Colorado's stockpond "evidence" because it was cumulative, unsubstantiated hearsay. Tr. 32. In light of Colorado's repeated misuse of the Bureau of Reclamation documents and pursuant to the Court's invitation to submit additional evidence, we moved the Master to receive new evidence which quantifies the stockpond depletions and places the documents in perspective. The Master refused to give New Mexico a hearing. Ignoring our tender of evidence, which contains the facts as opposed to the unsupported apprehension of a Vermejo Conservancy District official, the Master reached a number of unattested conclusions and offered a number of amorphous suggestions:

More careful administration in New Mexico might also alleviate some of the other problems causing water shortages or loss. One such problem is unregulated stockponds, fishponds and water detention structures. (Colo. Ex. No.s 38, 40). While there is no question that such water use is to a certain extent necessary and beneficial, some sort of restrictions should apply. The numbers of ponds and other structures might be limited; when appropriate, reuse should be developed; and, the extent of water diverted to these areas should be in some way monitored or controlled. There is some indication by New Mexico that approximately 2,024 stockponds exist in Colfax County. (Defendants' Brief on Remand, p. 53). Reduction and/or regulation of some type could not help but be an effort, however small, to conserve the water supply and put it to beneficial use. Report of May 31, 1983 at 18.

The facts would have sobered the Master's enthusiasm. New Mexico State Engineer Technical Report 44, Table 33, p. 21, shows the total evaporation from the 2,024 stockponds in Colfax County to be 2,124 acre-feet in 1980. The drainage area of the

Vermejo River above the Conservancy District diversion comprises 8% of the total area of Colfax County. It is conservative to assume that 8% of the stockponds is located in the Vermejo River drainage above the District's diversion because the drainage is more mountainous, has more live water, and fewer cattle are pastured per square mile than in the rolling prairie area of Colfax County. See Amended Narrative Tender of Evidence and Requested Findings of Fact and Conclusions of Law, at. 2-4. Under such a conservative assumption, the total depletion of the Vermejo River in 1980 above the District's diversion as a result of stockponds would have been 170 acre-feet ($2,124 \times 8\%$).

The data upon which the figure of 2,124 acre-feet evaporation are based show a total of 2,024 stockponds in Colfax County.²⁰ Again employing the conservative assumption that they are spread uniformly throughout the county, there would be a total of 162 ponds in the Vermejo River drainage above the District's diversion dam. Using data on stockpond capacity from State Engineer Office hydrographic surveys in other areas of the state, New Mexico's expert, Mr. Mutz, estimated that the total effective capacity of the 162 ponds is 441 acre-feet. It should be emphasized that the ability of such capacity to deplete the Vermejo River is limited to the evaporation from the ponds as computed above, neglecting the minimal amount of water consumed by cattle and wildlife. Leakage and seepage from the stockponds return to the river system and do not deplete the river. It should also be emphasized that the use of water by stockponds is a beneficial use as the Master admits and necessary to provide water for cattle to effectively use the available grazing areas. The drainage area above the Vermejo diversion dam totals 317 square miles, which indicates a stockpond density of 0.50 per

²⁰ While rejecting New Mexico's evidence, the Master took the figure of 2,024 stockponds out of our tendered evidence and used it against us. See, Report of May 31, 1983 at 18.

square mile ($162 \div 317$). N.M. Ex.No. C-2. Such a density does not indicate a proliferation of stockponds. Further, this density is consistent with good ranch management practices to balance availability of forage and the distance cattle must travel to water. *See Narrative Tender of Evidence and Requested Findings of Fact and Conclusions of Law*, at 2-4.

Following our initial estimation of stockpond depletion we undertook an actual hydrographic survey of all the stockponds in the Vermejo Conservancy District diversions. The survey was conducted by experienced surveyors under the direction of Eluid Martinez, a registered professional engineer and land surveyor and Chief of the Hydrographic Survey Section of the New Mexico State Engineer Office. *See Affidavit of Eluid L. Martinez*, at 1-2. All of the ponds in the Vermejo drainage were identified and located in the survey. A representative sample of the stockponds (31%) was surveyed in the field by planetable mapping to delineate maximum water surface area and depth of the ponds. Volume was also determined.

The facts are as follows: (1) there is a total of 80 stockponds in the entire Vermejo River drainage in New Mexico above the Vermejo Conservancy District's diversions; (2) there are no unadjudicated "fishponds" or unauthorized flood control structures in the Vermejo River drainage in New Mexico; (3) the aggregate capacity of all stockponds in service at maximum water surface level is calculated to be 212 acre-feet; and (4) while the actual depletion is less, the maximum annual depletion from all of the stockponds ranges from 182 to 192 acre-feet. *See generally, Affidavit of Eluid L. Martinez*, at 2-4.

These facts contrast with Colorado's exploitation of a single statement, repeated in a number of Bureau of Reclamation letters, expressing the unfounded fear of a former official of the Vermejo Conservancy District. Colorado's evidence has *no*

factual support in the record. The factual data we offered establishes unquestionably that there is no proliferation of unregulated stockponds in the Vermejo system and that the depletion from the existing ponds is insignificant.

While New Mexico believes that the Master's refusal to receive hard facts on the manufactured issue of stockpond depletion was discriminatory and denied us our right to a hearing, it remains that the Master made no specific findings. He concluded that "some sort" of restriction should apply, that limiting the number of stockponds and other structures "might" help, and rhetorically, that "regulation of some type could not help but be an effort . . . to conserve the water supply and put it to beneficial use."²¹ Report of May 31, 1983 at 18. If he had listened to the facts, he would have known that the Vermejo Conservancy District's water shortage has not been caused by stockponds. Even if there were a problem, however, the Master has neither quantified it nor offered a concrete and feasible way to resolve it. On the record, he couldn't have.

Conservation Measures in Colorado

The Court also requested specific findings of fact relating to the extent to which reasonable conservation measures in Colorado might eliminate waste and inefficiency in the use of water from the Vermejo River. In this regard the Court said that "it is appropriate to consider whether Colorado has undertaken reasonable steps to minimize the amount of diversion that will be required." 103 S. Ct. at 547. The Master disagrees. He feels "it is not for [him] or for New Mexico to say that reasonable attempts to conserve water will not be implemented by Colorado." Report of May 31, 1983 at 21.

²¹ Watering stock is a beneficial use in every state in the West, except, in the Master's mind, in New Mexico. Along with the Vermejo Conservancy District, the Master is recommending as well that the Court let our cattle industry die.

If the Master were to heed the Court's request, the conclusion he must reach is that Colorado has undertaken no steps to minimize the amount of diversion that will be required because C.F. & I. has no definite or even tentative construction design or plans and has prepared no economic analysis of its proposed diversion. Tr. 758-59. While C.F. & I. contemplates the construction of a reservoir in conjunction with the proposed diversion, no operational study of the proposed reservoir has been made. Tr. 766.

The Court has reiterated that equitable apportionment is a doctrine which requires " 'the exercise of an informed judgment on a consideration of many factors....' " 103 S. Ct. at 545, citing *Nebraska v. Wyoming*, 325 U.S. 589, 618 (1945). One of the specific factors the Court is interested in being informed about in this case is whether Colorado has sought to minimize the amount of diversion that would be required by C.F. & I. The evidence shows that Colorado has not and thus has wholly failed to carry its burden in this regard. See 103 S. Ct. at 548, n. 13.

POINT V

**THE SPECIAL MASTER COULD NOT MAKE SPECIFIC
FINDINGS OF ULTIMATE USES OR BENEFITS TO
COLORADO AND THUS COULD NOT COMPARE
BENEFITS IN COLORADO WITH INJURY TO
NEW MEXICO.**

Few points of analysis exhibit the Special Master's failure to reasonably weigh the evidence so clearly as his treatment of the proposed uses of Vermejo water in Colorado. In its opinion of December 13, 1982, the Court created a standard for evaluating future uses and benefits in equitable apportionment litigation. The Court required the Special Master to make specific findings as to the "*precise nature* of the proposed intermin and ultimate use in Colorado of water from the Vermejo River, and the benefits that would result. . . ." 103 S. Ct. at 549 (emphasis added). According to the Court, Colorado had to provide "clear and convincing evidence" to support specific findings on this point. 103 S. Ct. 547-48, n. 13. Colorado failed to satisfy this standard. In his report, the Master acknowledges this expressly. Report of May 31, 1983 at 23. More importantly, he makes no findings showing the precise nature of the contemplated uses of Vermejo water in Colorado or any benefits therefrom that would outweigh injury to New Mexico. The Master's findings favoring Colorado's proposed uses demonstrate both the difficulties and the potential for abuse inherent in a standard which balances future uses against an existing economy.

The Master states that the uses to which this water would be put in Colorado cannot be determined: "there is no way for the Master or the Court to know . . . "how many of the uses would be developed to a final stage of operation." *Id.* He nevertheless holds that this "difficulty" cannot be allowed to prevent Colorado from receiving its "rightful supply" of water. *Id.* In

other words, although the evidence does not support the proposition that Colorado has determined its proposed uses with sufficient specificity to justify an award of water, the Special Master recommends an award of water nonetheless. In the Master's view, Colorado has a "rightful supply" of water that would transcend any facts or equities. *Id.* His report would enable Colorado to accomplish what the Court has sought to prevent — an award of water for undetermined future uses to which only speculative or unproved benefits could be attributed and by which the compelling equities inherent in an existing economy would be diminished.

To make use of Vermejo water, the C. F. & I. Steel Corporation must undertake a transmountain diversion from the Vermejo's tributaries into the Purgatoire River Valley. This is known as the "Ricardo Project." Tr. 657, 665. The evidence shows the feasibility of the project to be undetermined. The construction of a reservoir is contemplated at the junction of Sierra Blanca and Johnson Creeks to store water. Tr. 713-14. However, no engineering or financial feasibility study for such a reservoir has been made. Tr. 766. The costs of the Ricardo Project have never been fully analyzed. Tr. 758-59. No evidence was presented to show how the diversion facilities would be constructed. Tr. 760. No projected costs beyond a rough estimate several years ago have been made. Tr. 759.

Although the Special Master notes the interim and ultimate uses that Colorado discussed, the evidence shows these to be entirely speculative and uncertain. Colorado argued that the water would be initially used for interim agricultural purposes and subsequently for industrial uses. Colorado could not testify how long the interim use might or might not last. Tr. 765. The ultimate justification for the Ricardo Project would be the proposed industrial uses. Tr. 762. Two primary industrial uses

were mentioned: a coal washery and a synfuel project. Tr. 762. Other uses discussed include hydroelectric power, recreational, and domestic purposes. Tr. 730. None presently exists:

[Mr. Adkins] So in answer to your question, today at this moment, the situation is as I stated there, the coal washery does not exist, the sawmill operation is not on line today, and therefore, at this immediate moment, the only use would be agricultural. Tr. 785.

The status of the two projected industrial uses is highly questionable. The testimony showed that the coal washery would operate in conjunction with two mines — the Allen and Maxwell Mines. Tr. 714. However, the use of water for coal washing in connection with these mines would not exceed 400 acre-feet per annum. Tr. 761, Colo. Ex. No. 15 Revised, p. 24. In addition, the operational status of the Allen Mine is uncertain. Mr. Adkins, the C. F. & I. official with responsibility for the Ricardo Project, testified that the reserves from this mine were virtually exhausted and that the mine was nearing the end of its productivity. Tr. 714.

The use of Vermejo water for a synfuel project is also uncertain. The water requirements for this use have not been defined. Tr. 740. Mr. Adkins testified that he had "no way of knowing" how the water would be used for synfuel development. Tr. 762. C. F. & I. has not even determined the feasibility of a synfuel project. Colo. Ex. No. 13, p.5.

The other proposals are equally speculative. There is no currently existing use for the sawmill. Tr. 785. The same is true of the hydroelectric, recreational and domestic uses. Tr. 785. No analysis or engineering work for any power plant has been undertaken. Tr. 744. The domestic use is only a possibility. Tr. 747. No precise plans for any of these projects were submitted at trial. The record contains no firm cost estimates, no blue prints,

no plats, and no contracts for any of the ultimate uses. At most, the record reflects C. F. & I.'s ideas of several years ago. All that was shown was that a steel corporation wants to take water for some undefined use in the future. Tr. 712, 783, 795.

There is no credible evidence in the record to support economic benefit in Colorado from these diversions. In Colorado Exhibit No. 15 Revised, the benefits that C. F. & I. hopes to derive through construction of the Ricardo Project are summarized. The exhibit was authored by Mr. William Nelson, an urban planner. Tr. 812. Although the exhibit prepared by him purports to analyze economic factors involving comparative agricultural values, Mr. Nelson has never studied agricultural economics, and he agreed that the report could not be called an agricultural economic study. Tr. 812-13. The exhibit was an "impact study" which relied upon figures provided by C. F. & I. Tr. 822. The study expressly discounted the numerous economic factors associated with the projects mentioned by C. F. & I. and attributed all of the economic benefit solely to the presence of Vermejo water. Tr. 830, 832. Despite the presence of other factors to which part of the economic benefit must be attributed, e.g., the existence of the resource, labor, capital investment, and the economic climate, no other factors were analyzed. Tr. 2298. No effort was made to distinguish what portion of the benefit would be due to Vermejo water. Tr. 2298. The impact study thus distorts the role of the Vermejo and is analytically valueless in assessing benefits associated with the proposed use of Vermejo water by C. F. & I.

In short, Colorado's proposed uses are as speculative today as they were in 1975 when the District Court for Water Division No. 2 rejected C. F. & I.'s application in Case No. W-3961, because of the speculative nature of the proposed project. Tr. 731-32. In moving to reconsider on May 6, 1975, C. F. & I.

sought to minimize this consideration by arguing that "it is not required as a matter of law that specific needs or uses be shown" Motion for Reconsideration, Case No. W-3961. Notwithstanding C. F. & I's position, the Court imposed precisely this requirement on Colorado as part of its burden of proof. 103 S. Ct. 547-48, n. 13. It was not satisfied.

What is evident from the Master's discussion of this issue is the inherent speculation involved in balancing unproven benefits to Colorado against the existing economy in New Mexico. The Master's treatment of the evidence in this area and his attempt to balance indeterminate benefits to Colorado against the detriment to New Mexico demonstrates that the balancing of proposed uses with an existing economy on a fully appropriated stream is unworkable. As demonstrated by the Special Master, this balancing invites a comparison of something concrete with something speculative and amorphous. This problem was considered by Justices O'Connor and Powell in their opinion:

In equitable apportionment litigation between two prior appropriation States concerning the waters of a fully appropriated river, this Court has never undertaken that balancing task outside the concrete context of either two established economies in the competing States dependent upon the waters to be apportioned or of a proposed diversion in one State to satisfy a demonstrable need for a potable supply of drinking water. In the former context, the Court may assess the relative benefit and detriment by reference to the actual fruits of use of the waters in the respective States. In the latter context, the compelling nature of the proposed use reduces the speculation that might otherwise attend assessment of the benefits of a proposed diversion. Where, as here, however, no existing economy in Colorado depends on the waters of the Vermejo and the actual uses in New Mexico rank in equal

importance with the proposed uses in Colorado, the difficulty of arriving at the proper balance is especially great. 103 S. Ct. at 550-51.

These concerns are borne out by the Special Master's report. Colorado's proposed uses are entirely speculative, uncertain, and remote. No economic benefits can be determined from the record. The Master does not even attempt to make the specific findings of benefit to Colorado that the Court required. He states only that he has reviewed the evidence and finds that there will be "substantial" benefits because it is his "opinion" that Colorado's proposed uses are sufficiently weighty to allow an apportionment of water. Report of May 31, 1983 at 24.

The balancing attempted by the Special Master indicates a potential for abuse inherent in balancing existing equities against the speculation that accompanies a proposed future use. The existing economy has to live in the real world as opposed to the imagination. It is the existing economy which must contend with acute water shortage, refute allegations of wasteful or inefficient irrigation practices, and produce a ledger marked in black and red at the end of each year. The proposed use escapes such scrutiny. No yardstick of precision or feasibility was required by the Special Master in assessing C. F. & I's future use. This conflicts with the Court's affirmation that "the equities supporting the protection of existing economies will usually be compelling." 103 S. Ct. at 547. In addition, the Master's application of the Court's opinion would force a decision based upon the comparative quality and profitability of proposed uses as opposed to the equities arising from existing uses, a comparison made impossible by the fact that the future use need not justify itself with specificity. See 103 S. Ct. at 551.

This kind of balancing has never been undertaken in the past. In the first opinion in this case the majority referred to *Nebraska v. Wyoming*, 325 U. S. 589 (1945), in which an apportionment of the North Platte River was effected on behalf of an existing economy in Colorado based upon junior appropriations. The Court noted in that case that the rule of priority should not be strictly applied where it "would work more hardship" on the junior user "than it would bestow benefits" on the senior user. 325 U.S. at 619. The facts, however, reveal a fundamental difference in circumstances which shielded the Court from the conjecture inherent in balancing existing equities against a future use. In *Nebraska v. Wyoming*, *supra*, the balancing of benefit against injury was undertaken only when it was shown that the water involved would benefit the junior use but not the senior use. The Court said:

If a canal in North Park [Colorado] were closed to relieve the shortage of a senior appropriator in Nebraska, it would be highly speculative whether the water would reach the Nebraska appropriator in time or whether the closing of the Colorado canal would work more hardship there than it would bestow benefits in Nebraska. 325 U.S. at 619.

In other words, the balancing of benefit and hardship was a balancing between the complete loss of the water to the junior appropriators in Colorado and the likelihood that the benefits arising from the alternative use by the senior downstream users in Nebraska would not have been realized to any significant extent because the water would not have arrived in time or in sufficient quantity to have been of benefit. The principle articulated in the balancing of benefit and hardship in *Nebraska v. Wyoming* was not a judgmental balancing of the economic value of Nebraska's uses with Colorado's, but rather the

principle which underlies a futile priority call. That same principle is not present here.²²

In part this principle is based upon the Court's recognition that it is proper to weigh "the harms and benefits to competing states," as was done in *Kansas v. Colorado*, 206 U.S. 46(1907). There, the Court said: "we declined to grant any relief to Kansas on the grounds that the great benefit to Colorado outweighed the detriment to Kansas." 206 U.S. at 100-101. The principle discussed in *Kansas v. Colorado*, however, like the principle in *Nebraska v. Wyoming*, is not applicable here. The *Kansas* Court was not balancing speculative economic value with existing economic value in order to weigh the possibility of displacing the latter because the new use was "better." On the contrary, the Court was there addressing a profound practical problem that arose accidentally by virtue of conflicting exercises of sovereign power. The issue was whether the Court should countenance slight injury in Kansas in order to save two existing economies, not whether the Court could allow a new use in Colorado to the detriment of existing uses in Kansas. Here, a conflict of developed interests hasn't forced the issue.

In conclusion, the Master's attempt to balance benefit and detriment "highlights the restraint with which the Court should proceed in apportioning interstate waters between a State seeking a future use and a State with an existing economy dependent upon the waters to be apportioned." 103 S. Ct. at 551. In scrutinizing the existing uses, the Master was quick to find fault. In making the other half of his analysis, the Master could make no specific findings, but rather projected an idealized

²² Similarly, the facts in *Washington v. Oregon*, 297 U.S. 517 (1936), did not result in a judgmental balancing of comparative economic value, but rather the Court's determination that "[d]uring the period of water shortage, only a small quantity of water would go by if the dams should be removed." 297 U.S. at 522-523.

concept of the proposed future use. The Court could have no clearer demonstration of the difficulties inherent in the problematic balancing of existing equities with a future use.

POINT VI

THE MASTER'S RECOMMENDATIONS WOULD GUARANTEE INJURY TO ALL EXISTING USERS OF VERMEJO WATER IN NEW MEXICO, DEPRIVING NEW MEXICO OF NEARLY 4,000 ACRES OF IRRIGATED LAND.

Based upon his failure to assess the demand in relation to supply, his double standard of efficiency, and his view that reasonable — albeit unspecified — conservation measures are available to New Mexico and its water users, the Master concludes that “[t]he injury, if any, resulting from the Colorado diversion could be offset.” Report of May 31, 1983 at 29. In reaching this conclusion, which is demonstrably wrong, the Master is talking about the “injury, if any,” in excess of the loss which would derive from the Master’s mistaken conclusion that the acreage not irrigated in the 1970s was left fallow for lack of diligence. In other words, when the Master speaks of maintaining the *status quo*, he is talking about a *status quo* already reduced by 3,839.87 acres.

The acreage decreed, the acreage claimed, and acreage used by the Master to assess the demand are as follows:²³

²³ While the Master articulates his findings in regard to nonuse in terms of reduced acreage, he is not recommending that particular acreage be forfeited. Instead, in the guise of reduced acreage the Master is recommending that New Mexico’s legitimate demand be reduced by over one-third.

<u>Users</u>	<u>Decreed Acreage</u>	<u>Acreage Claimed by New Mexico to be Diligently Developed</u>	<u>Acreage Used by Master</u>
Vermejo Park	870.2	690	250
Kaiser	315	315	180.74
	(630a.f.) ²⁴	(630a.f.)	(361.47a.f.)
Phelps Dodge.....	301.19	250	150
Private users	477.81	477.81	312.1 ²⁵
Vermejo Conservancy District	<u>14,621.55</u>	<u>7,379</u>	<u>4,379</u>
	16,585.75	9,111.81	5,271.84

While the acreage decreed on the mainstem Vermejo is 16,585.75 acres, New Mexico is asking the Court to protect 9111.81 acres, with most of the difference deriving from the Bureau of Reclamation's determination of the acreage that could be supplied with water in the Vermejo Conservancy District after its works were rehabilitated. The Master, however, is recommending that the Court protect only 5,271.84 acres on the theory that the users in New Mexico should be blamed for the drought of the 1970s. In the Master's mind, this recommended, permanent reduction of acreage in New Mexico would not be injury, but rather is the starting point in his discussion of injury.

As fully explained in Points II and III, the Master's recommended reduction in acreage cannot be justified on the ground of lack of diligence and therefore is nothing more than a recommendation to injure. The water supply as shown by Table 2 in the Master's report, was short of demand as follows in the 1970s:

²⁴This is the quantity of water resulting from transfer of the tabulated acreage of irrigation rights to industrial use.

²⁵This figure includes a mistake made by the Master. He recognizes 88.4 acres for Mr. Messick when his right does not exceed 48.4 acres.

<u>Year</u>	<u>Supply at Dawson Gauge</u>	<u>Demand at Dawson Gauge</u>	<u>Shortage</u>
1970	13,030 a.f.	17,000	- 3,970
1971	5,660	17,000	-11,340
1972	4,680	17,000	-12,320
1973	12,920	17,000	- 4,080
1974	3,040	17,000	-13,960
1975	7,530	17,000	- 9,470
1976	6,640	17,000	-10,360
1977	7,900	17,000	- 9,100
1978	8,650	17,000	- 8,350
1979	12,570	17,000	- 4,430
	82,620	170,000	-87,380 ²⁶

The supply was short in each year, and the total shortage during the decade was 87,380 acre-feet.

It shouldn't take any citation to law to show that water rights are not subject to forfeiture for reasons beyond the control of the water users. *In re C. F. & I. Steel Corporation in Las Animas County*, 183 Colo. 135, 515 P.2d 456 (1973); *State of New Mexico ex rel. Reynolds v. South Springs Co.*, 80 N.M. 144, 452 P.2d 478 (1969); *Rocky Ford Irrig. Co. v. Kents Lake Reservoir Co.*, 104 Utah 202, 135 P.2d 108 (1943); *Federal Land Bank v. Morris*, 112 Mont. 445, 116 P.2d 1007 (1941); *Scherek v. Nichols*, 55 Wyo. 4, 95 P.2d 74 (1939); *Gould v. Maricopa Canal Co.*, 8 Ariz. 429, 76 P. 598 (1904). To deprive New Mexico's water users of their property rights because of an act of God simply is senseless.

²⁶ As explained in Point III, these figures contrast the actual annual supply with the actual annual demand at the Dawson gauge, taking into account water supplied by the Chico Rico and other minor sources.

The Master, however, is further persuaded that the New Mexico users in the Vermejo Conservancy District could have irrigated all of their water right acreage in the 1970s because of the District's reservoirs:

As noted earlier, the District has a reservoir system allowing carryover from wet years to supply water during periods of shortage. Therefore, the user most affected *does* have a means of offsetting the possible shortage. Report of May 31, 1983 at 27.

Again, the Master's logic is not very dependable. The total capacity of the District's six reservoirs is about 22,600 acre-feet as originally built. The total annual demand for water at the District's reservoirs to irrigate the 7,379 acres in the project is approximately 17,800 acre-feet. If the District's six reservoirs were filled to near capacity, that storage would provide a full water supply for only one year to the total project acreage, taking into account evaporation and seepage losses from the reservoirs. As the water shortage figures show, however, the water supply was short every year during the drought of the 1970s. The last year previous to the 1970s when the supply exceeded the demand and might have provided water for storage was 1965. See Point III at 40-41. That surplus, however, dissipated quickly. Just where the Master finds the water to carry over to or in the 1970s is a mystery.

Part of the Master's rationale is that the injury that would be caused in New Mexico doesn't really matter:

The injury, New Mexico fears, may even extend to the federal government, to whom the Vermejo Conservancy District owed in excess of two million dollars. However, such a state of affairs would be nothing new in this case. From the beginning the District has had problems making

their payments. (Tr. 168; Plaintiff's Ex. No. 38, Plaintiff's Ex. No. 6 at 9). Remedies from reduced payments to bills in the legislature relieving the District of payments altogether have been proposed. In this light, it hardly seems reasonable or accurate to blame the District's debt default on the proposed Colorado diversion. Report of May 31, 1983 at 27.

The first question is why not. With the reduction of 3,000 acres in the District for alleged lack of diligence in the 1970s, the United States can be assured that the debt will not be paid. Also, the Master doesn't appreciate Congress' obvious intent when it passed legislation temporarily relieving the repayment instead of permanently excusing it.²⁷

The same attitude underlies the Master's opinion of the Vermejo Project itself:

... [T]estimony leads to the conclusion that shortages resulting from [the] Colorado diversion... would be experienced in a project that has failed from the beginning to develop its allotted acreage, has failed to meet its financial obligations, and quite possibly should never have been built. Report of May 31, 1983 at 8.

The Master's intolerance, however, shows only his lack of familiarity with water supply conditions in general in the West and on the Vermejo in particular.

In the recent past, the water supply of the Vermejo River has not been what was anticipated in the early 1900s or even as late as the 1950s. This situation is not unique among western rivers. In 1922, the Colorado River Compact negotiators anticipated a

²⁷ It should be noted that the United States would be injured in another way, namely, by depriving the Maxwell National Wildlife Refuge of badly needed water. Tr. 2045.

flow at Lee Ferry well in excess of 15,000,000 acre-feet per year. That amount has not been realized in any long-term period that includes the flows occurring after 1945. The average annual virgin flow is now estimated at 14,000,000 acre-feet annually or less. The critical drought period of the Upper Colorado Basin extends through the year 1964. Other western rivers have critical drought periods extending into the 50s. The critical drought period of the Vermejo extends into the 70s. Ute Reservoir, which is located on the Canadian River, of which Vermejo is tributary, was estimated to provide a firm annual yield of about 44,000 acre-feet per year in studies made in the 1960s. With the drought of the 1970s, the yield of that reservoir through the critical drought period extending through 1978 has been reduced to 16,000 acre-feet per year. The record in this case shows that at the time the final planning report for the Vermejo Project was prepared by the Bureau of Reclamation in 1952, there was a water supply to irrigate 7,379 acres of the more than 14,000 acres decreed. *See* N.M. Ex. No. C-2. The project was rehabilitated accordingly. In the development of the water supply studies undertaken by the Bureau of Reclamation in 1952, the flow available at the Vermejo Canal diversion was estimated to be 19,800 acre-feet annually; of this amount only 12,700 acre-feet annually was available as inflow to the District's reservoirs. N.M. Ex. No. C-2, p. 41. In other words, 12,700 acre-feet annually from the Vermejo River were estimated to be available for the development of the 7,379 acres served by the project. However, the water supply declined abruptly in the early 1950s, recovered somewhat in the 1960s, and declined again in the 1970s. The average annual recorded discharge of the Vermejo River at Dawson was as follows:

1950-1959	10,000 acre-feet
1960-1969	11,500
1970-1979	8,300

See Colo. Ex. No. 5, Table 2.

Notwithstanding his reliance on long-term averages, the Master noted that the average annual flow of the Vermejo River near Dawson during the 1970s was 8,262 acre-feet. Report of May 31, 1983 at 11. When he conjectures that "even an average of 10,900 acre-feet at the Dawson gauge would seem to provide a fair amount of available water, and more than enough to supply the current uses below the gauge," he forgets that the average annual flow at the Dawson gauge for the 1970-79 period was only 8,262 acre-feet, much less than the 10,900 he prefers to use to assess shortage and diligence in the 1970s.

Aside from the Master's own figures in Table 2 of his Additional Factual Findings, New Mexico estimated the water supply available to the District for both the 1950-78 and 1955-79 periods. N.M. Ex. No. F-29. This study included the available water supply for the decreed acreage of Phelps Dodge Corporation and for the five private users diverting from the Vermejo Canal. It also included spills at the Vermejo Canal diversion, accretions to the flow below the Dawson gauge, and losses in the Vermejo Canal. It further demonstrates the lack of water to meet the demand. For example, in the five-year period 1950-54, the annual flow at the Dawson gauge ranged from a minimum of 1,300 acre-feet to a maximum of 6,400 acre-feet and averaged 4,300 acre-feet. During the same period the annual inflow to the Vermejo Conservancy District reservoirs ranged from 200 acre-feet to 4,600 acre-feet and averaged 2,700 acre-feet. The net depletions by Phelps Dodge Corporation and the five private users and losses in the Vermejo Canal account for the difference in flow between the Dawson gauge and the District's reservoirs. There were no spills. Shortages occurred to Phelps Dodge and the private users.

While the supply in the 1960s recovered somewhat, the accumulated deficit for that period was 54,890 acre-feet. See Point III at 41. Beginning with the year 1970, however, the river

again entered a period of deficient runoff that extended through 1978 except for the year 1973 in which the runoff was 118% of the average flow for the 1955-79 period, an insufficient amount to refill the District's reservoirs following the two successive dry years in 1971-72. N.M. Ex. No. F-24. During the period 1974-78, inclusive, recorded flow at the Dawson gauge ranged from 2,700 acre-feet to 8,700 acre-feet and averaged 6,700 acre-feet. In the same period, the inflow to the Vermejo Conservancy District reservoirs shown in N.M. Ex. No. F-29 ranged from 1,600 acre-feet to 7,100 acre-feet and averaged 5,200 acre-feet. The aggregate inflow was 25,900 acre-feet during the five year period, which is less than a two year supply.

The water supply figures show that the Vermejo was chronically short during the 1970s, the period which the Master used to reduce New Mexico's diligently developed entitlement by 3,840 acres. The Master's finding of lack of diligence is therefore unsupported and his recommended reduction is a recommendation that the Court order that New Mexico be injured. The Court's opinion rejects an apportionment of the Vermejo River that would result in unacceptable injury to New Mexico. The Court emphasized its intention to protect the economy that is dependent upon the Vermejo in New Mexico by stating that the equities supporting an existing economy "will usually be compelling." 103 S. Ct. at 547. While the Court acknowledged that the Special Master's recommendations were based upon a conclusion that the Vermejo Conservancy District was not economically feasible, this was not accepted. 103 S. Ct. at 514. The case was remanded to obtain factual findings for evaluating injury to New Mexico.

Beyond the hydrologic fact that the Master's recommendations would severely injure New Mexico, three considerations are relevant to this inquiry. They include the role of the Vermejo River in the economic life of Colfax County, the

value of the economic activities conducted by the primary beneficiaries of the use of Vermejo waters, and the contribution made by those beneficiaries to various secondary or indirect beneficiaries.

Colorado made no analysis of the Colfax County economy, of its dependence on the Vermejo River, or of the consequences of diversions of 4,000 acre-feet per year to New Mexico. Tr. 833-34, 842-44. New Mexico's economic witness, Dr. Lee Brown, undertook an extensive analysis of the economic importance of Vermejo River water to its current users, to Colfax County, and to the State of New Mexico. His objective was twofold. He sought to measure and evaluate the degree of economic dependence of existing water users upon the waters of the Vermejo, termed the primary beneficiaries, and the indirect benefits accruing to other entities, termed the indirect or secondary beneficiaries.

The principle method utilized in determining the economic reliance of New Mexico on the Vermejo was benefit analysis. Tr. 2258. The use of benefit analysis is designed to yield a determination of the economic benefits which are attributable to a particular source, in this case the Vermejo River, by apportioning economic gain or loss to the various factors associated with it. Tr. 2298. Such an analysis shows the benefits accruing to Vermejo water users directly and to other indirect or secondary beneficiaries. Tr. 2258-66, N.M. Ex. No. F-33, pp. 29-30. It allows for a separation of the benefits attributable to the Vermejo from those attributable to other sources, like capital investments or labor, and provides the basis for conclusions on the effect of Colorado's proposed diversion from the Vermejo tributaries.²⁸ Tr. 2257, 2259-61. Colorado made no such analysis.

²⁸ In standard economic practice the degree of economic dependence on a natural resource is measured by the *benefits* associated with the uses of that resource. Although no public water project is being planned for the Vermejo River, the concepts of economic benefit concerning the existing uses of water in the Vermejo are nevertheless identical to the measurement concepts contained

Dr. Brown's findings and conclusions are contained in New Mexico Exhibit No. F-33. The exhibit compares the activities conducted by the present day users of Vermejo water with the compensating actions that would be necessary without the water. The difference can be attributed to the availability and use of Vermejo water and expressed in economic terms. Tr. 2259-61, 2275-77. Dr. Brown was assisted by several economists including a team of agricultural and resource economists who extensively examined the water use made by the present-day users of Vermejo water in New Mexico as well as the secondary dependence of Colfax County and other entities upon the activities of the primary beneficiaries. Tr. 2262-67, 2274-77.

The rights of the primary beneficiaries are set out in Point II. The secondary or indirect beneficiaries are supported by the activities of the primary beneficiaries. Foremost among these is Colfax County. Tr. 2265-66. The economy of Colfax County is heavily influenced by the economic activities of the primary beneficiaries for employment and retail purchases and sales. Tr. 2265-66, 2274 N.M. Ex. No. F-33, pp. 41-50. Other secondary or indirect beneficiaries include the State of New Mexico, the federal government, and the State of Colorado.

By 1979, mining, agriculture, and retail trade were leading economic sectors of the Colfax County economy. N.M. Ex. No. F-33, p. 22. These industries include both primary and secondary beneficiaries from the Vermejo River. They are displayed on Table No. 7 of New Mexico Exhibit No. F-33 for the period 1973-1978.

in the federally approved methodology set forth in the documents. Senate Document 97, 87th Congress, 2d Session, Principles and Standards for Planning Water and Related Land Resources, and subsequent revisions. Just as federal benefit/cost criteria for a water development plan require that a comparison be made between "conditions expected with the plan to the conditions expected without the plan," so the benefits of Vermejo water in New Mexico require a comparison of existing conditions with expected conditions were the Vermejo water not available as it currently is. N.M. Ex. No. F-33, pp. 29-30.

The decade of the 1970s in Colfax County was a period of economic growth, due in large part to the development of the Kaiser mine.²⁹ Tr. 2271. This is attributable in part to economic activity associated with the Vermejo. There has been a 7.6% increase in the population of Colfax County since 1970. N.M. Ex. No. F-33, Tbl. 2-A, Tr. 2271. By 1979, the unemployment rate had declined to 5%, significantly below that of the State of New Mexico in general. Tr. 2271-72. Per capita income has risen.³⁰ Tr. 2272.

Approximately 17-20% of the irrigated acres in Colfax County is in the immediate vicinity of the Vermejo and rely upon Vermejo waters. Tr. 2273, N.M. Ex. No. F-33, p. 27. Other benefits of the use of Vermejo waters include employment and recreation. For example, Vermejo Park is a working and recreational ranch serving visitors from throughout the United States. Tr. 2274. Vermejo Park realized \$760,000 in revenues from hunting, fishing, and other recreational activities and \$300,000 in livestock revenues in 1979. N.M. Ex. No. F-33, pp. 31-33, Apps. A-1, A-2.

The most important single factor in the Colfax County economy is Kaiser Steel Corporation. Kaiser accounts for 9% of the employment of the county. Tr. 2273. Kaiser's sole operation is the York Canyon Mine which is dependent on the Vermejo for all of its coal mining activities. Kaiser employed 511 people in 1979 with a payroll of approximately \$1.62 million. N.M. Ex. No. F-33, p. 35. Kaiser made additional expenditures for capital

²⁹ The Master notes that the economic growth in Colfax County in the 1970s did "not appear to conform" to the fact of drought in the 1970s. Report of May 31, 1983 at 25. The Master neglects to advise the Court of New Mexico's evidence on the development of the Kaiser mine in the 1970s, to which this economic growth is attributable.

³⁰ Per capita income was \$6,385 in 1978, whereas for the state as a whole it was \$6,599 or 81% of the national average. Tr. 2272.

improvements, maintenance materials, and operating supplies. N.M. Ex. No. F-33, p. 35.

The Phelps Dodge property is currently leased by the C S Cattle Company which produces cattle, hay and pasture. C S produces between ten and twelve thousand bales of hay per annum of Vermejo watered lands and thus avoids expenditures of nearly \$4,800 annually. N.M. Ex. No. F-33, p. 36.

A diversion of 4,000 acre-feet per annum in Colorado would unquestionably exacerbate historical shortages in New Mexico. Analysis of injury on the Vermejo may be divided between Vermejo Park Corporation, Kaiser Steel Corporation, Phelps Dodge Corporation, the private appropriators served by the Vermejo Canal, the farmers of the Vermejo Conservancy District, and the Canadian River users. In the event of diversions of 4,000 acre-feet from the Vermejo tributaries in Colorado, there would be adverse hydrological impacts to all of New Mexico's water users, including those on the mainstem of the Canadian River. Mr. Mutz testified that the effect of this taking by C. F. & I. "can effect at least water users as far down stream as Ute Reservoir" on the Canadian River. Tr. 1382.

Aside from the permanent injury arising from the Master's recommended reduction in acreage, the effect on the direct flow users, *i.e.*, Vermejo Park, Kaiser Steel, Phelps Dodge, and the five private users, would be most severe during periods of low flow. Tr. 1263, 1323-24, 1330-31, 1379-80. During these periods Colorado could dry up the river above Vermejo Park. Tr. 1379-80. These users have no storage and no alternative water supply. Tr. 1380, 1183-84, N.M. Ex. No. F-18.

The analysis of the low flow conditions at the Dawson gauge presented in New Mexico Exhibit No. F-21 Revised indicated that if C. F. & I. had depleted the river by 5 cubic feet per second

during the months of April, June, and September of the years depicted in Exhibit F-21, shortages would have been experienced by Vermejo Park Corporation, Kaiser Steel, and Phelps Dodge. Tr. 1257. Based on an analysis of the recorded flow at the State line, as well as the Dawson flows, a diversion by C. F. & I. would have caused the river at Dawson to dry up in May, September and October of 1977. Tr. 1259-61.

The Vermejo Park Corporation would be the first user to experience shortages in low flow years. The record indicates that historical water shortages have forced Vermejo Park Corporation to concentrate its efforts on irrigating about 250 acres near the Corporation's ranch headquarters. Tr. 2084. If Colorado were awarded Vermejo water, inadequate flow in the river would force Vermejo Park to reduce diversions further as a result of priority calls by senior downstream water users.

The effect of C. F. & I.'s diversions on Vermejo Park and Kaiser Steel is also shown by New Mexico Exhibit No. F-30, which uses Colorado's own figures for water production from the tributaries. This exhibit demonstrates the effects on Vermejo Park and Kaiser of diversions in Colorado during individual months. Tr. 1260-61. For example, if in May of 1977 diversions of 340 acre-feet had been made in Colorado, increased shortages would have been experienced by both Vermejo Park and Kaiser. Similarly, had C. F. & I. taken 180 acre-feet in September 1977, the river at Dawson would have been dry. Tr. 1260. Neither Vermejo Park nor Kaiser can afford not to have water during the low flow periods. Tr. 1262. For Vermejo Park, this would reduce the yield of their crops to zero. For Kaiser, the lack of water would force the mine to cease operations. Tr. 1262. It is important to emphasize that Mr. Mutz's study gauged the effects on Vermejo users from an analysis of the monthly flow over a critical water supply period. He testified that no analysis of average annual flow could comprehend the effects of these diversions. Tr. 1262-63.

C. F. & I.'s diversions would materially increase shortages experienced by the Vermejo Conservancy District. Tr. 1311. Injury to the Vermejo Conservancy District would be especially severe during consecutive years of low flow. Evidence shows the effects on the District as a result of the low flow years of the 1970s. N.M. Ex. Nos. F-22, F-24, F-29, F-37. Although the District's demand is met in part by inflows from Chico Rico Creek, the District relies primarily on the Vermejo River, which produces about 70% of its water supply. Tr. 1303, 1319. The evidence shows that during a period of 54 consecutive months between 1945 and 1950, 67% of the District's flow was derived from the Vermejo. Tr. 1300-01. A diversion of 3,650 acre-feet by Colorado would have deprived the District of 33% of the farm delivery demand of 11,000 acre-feet during the 1950-1978 period. Tr. 1324. The average annual historical shortage during the 1950-1978 period was computed to be 6,350 acre-feet, or 57% of the farm delivery demand. N.M. Ex. No. F-37. The effect of a diversion by Colorado on the District would be disastrous. Tr. at 1324, 1381.

New Mexico users also testified to the effects on their properties of C. F. & I.'s proposed diversions. The opinions they expressed are the result of their personal experience irrigating from the Vermejo River.³¹

Mr. Charlesworth testified that Vermejo Park would be injured in several areas including impairment to cattle grazing

³¹ The following testimony represents the impact of Colorado's diversions as seen by New Mexico's witnesses, Bureau of Reclamation officials, and the water users themselves. Mr. Mutz, Tr. 1324-26; Mr. Charlesworth of Vermejo Park Corporation, Tr. 2090-92; Mr. Taylor of Kaiser Steel, Tr. 1732-32; Mr. Ochs of the Bureau of Reclamation, Tr. 1652-53; Mr. Odom, Tr. 2216-17; Mr. Pompeo, Tr. 2205; Mr. Knox of the Vermejo Conservancy District, Tr. 1837-38; Mr. Spencer of the Vermejo Conservancy District, Tr. 1964-65; Mr. Brock of the Maxwell National Wildlife Refuge, Tr. 2045, and the Regional Director of the Bureau of Reclamation, Mr. Weimer, Tr. 1547-70.

and fishing, and depreciated value of the land. Tr. 2090-91. Mr. Pompeo testified that his farm would be damaged by diversions in Colorado. Tr. 2205. Mr. Carl Odom testified that he did not believe that the result could be other than to lessen the supply of water available to his farm. Tr. 2217. He testified:

Well, a diversion of that much water and as dependent as we are on the Vermejo River because all of our cattle are dependent on the water from the Vermejo, livestock water there on the tract, as well as raising crops for the cattle, it is going to increase the cost of operation. Tr. 2216.

Mr. Taylor testified to the effects of C. F. & I.'s proposed diversions on Kaiser Steel. He said that there were two options: either to shut down the operations at the mine or to attempt to bring in water from the Cimarron River at a cost of \$12,000,000. Tr. 1732. Closing the mine would result in withdrawing \$14,500,000 annually in hourly wages and benefits from the economy. Tr. 1732.

The farmers of the Vermejo Conservancy District were equally explicit as to the injury that they would experience from C. F. & I.'s proposed diversions. Mr. Joe Kern of the Board of Directors testified that "it would be just a matter of time, we would all be out of business." Tr. 2026. Glenn Matthews testified that it was unlikely that the farmers could survive, as did Jack Spencer. Tr. 1998, 1965. Each believed that the proposed diversion would have a devastating impact on the community of Maxwell.

The result of diversions of 4,000 acre-feet in Colorado would be extensive economic and environmental injury to New Mexico. Economic injury would consist of immediate financial losses to primary beneficiaries. This would be accompanied by financial losses to the indirect or secondary beneficiaries. Environmental injury would occur with the destruction of the habitat necessary to support the Maxwell Wildlife Refuge.

The direct losses to four users are summarized in Table No. 12 of New Mexico Exhibit No. F-33. The hydrological evidence indicates that Vermejo Park risks the loss of its water supply in low flow years. Tr. 1260-63. An analysis of the value of Vermejo Park's water was supplied by officials of the corporation. Tr. 2277, N.M. Ex. No. F-33, p. 45. On that basis the gross annual economic loss in years of shortage was computed to be \$760,000 in lost revenues from hunting, fishing, and other recreational activities, and \$300,000 in livestock revenues due to the inability to irrigate and provide stockwater. N.M. Ex. No. F-33, pp. 31-32. In losses to indirect beneficiaries, there would be a reduction of approximately \$870,000 in salary disbursements to Colfax County and to vendors in New Mexico and Colorado. N.M. Ex. No. F-33, p. 32. The annual net loss to Vermejo Park in times of shortage would be \$190,000. Tr. 2279, N.M. Ex. No. F-33, p. 32.

As New Mexico's principal witness, Mr. Mutz, testified, the Vermejo Conservancy District is the most vulnerable. Colorado's diversions threaten the major part of its water supply. Tr. 1381. This would entail loss of the District's collective fixed assets because many of the reservoirs, ditches, and improvements would have little or no value if there were not water available to make them useful. N.M. Ex. No. F-33, p. 38.

The debt of \$2,066,057.95 owned by the District to the federal government as of June 30, 1979, would continue to be in default. N.M. Ex. No. F-33, p. 38. The value of the individual landholdings would be reduced by \$200 an acre. The farms would have little value without water. N.M. Ex. No. F-33, p. 39. In sum, the farmers of the District would be deprived of their property without compensation of any kind.

Because of its location within the Vermejo Conservancy District, there would necessarily be financial and environmental injury to the Maxwell Wildlife Refuge. New Mexico Exhibit No.

E-18 shows the impact of water shortage on the Refuge. During the water short years of 1976 and 1977 there was an "extreme" drop in the number of geese using the Refuge. Tr. 2044. In addition, the migratory duck population was reduced. Tr. 2044. The consequence of water shortage induced by Colorado's diversions would perpetuate conditions of shortage for the Refuge and depredate the surrounding habitat. Mr. Brock testified:

If there is a further reduction in water supply it could hurt us two ways.

Number 1, if the amount of water that is available for irrigation is reduced, that will reduce our farming acreage which in turn is going to directly affect the water fowl populations. And also the wildlife in the area are dependent upon the lakes for surface water. And a large reduction in the surface water will also affect them adversely.

Q. Would it be your opinion, Mr. Brock, that a further reduction in water supply would directly undermine the purpose of the Maxwell Wildlife Refuge?

A. Yes, it would. Tr. 2045.

Loss of Vermejo water would also result in the reduction or elimination of the economic value of the facilities and equipment of the Refuge, the replacement value of which is \$1,749,000. N.M. Ex. No. F-33, p. 39. Loss in annual benefits of \$76,000 would result from the cessation of funds provided by Congress to preserve the recreational nature of the Refuge. N.M. Ex. No. F-33, p. 39.

A great dilemma caused by Colorado's diversions would fall on Kaiser Steel. The evidence shows that Colorado's diversions

would render Kaiser's water supply uncertain and could frequently dry it up. Tr. 1260-62. As a result, Kaiser would be faced with two options — to pipe water from the Cimarron River or to close the York Canyon Mine. Tr. 2280, 2282. Under the first alternative, the capital cost of transporting water from the Cimarron River was estimated at \$12,000,000. Tr. 1732. Amortizing this investment would result in additional yearly expenditures or lost profits of \$1,521,000 to \$1,770,000. Tr. 2281, 2295. The other alternative would be to cease operations. Mr. Taylor testified that closure of the mine for one year would result in losses of \$14,500,000 in hourly wages and benefits in New Mexico. Tr. 1732. An additional \$3,700,000 in supervision and wages would be lost. Tr. 1732. In 1980, Kaiser had capital improvements and purchases of maintenance materials totalling \$1,100,000. Tr. 1733. These would not be made.

The methodology used by Dr. Brown and his associates to measure the economic injury to indirect beneficiaries consisted of two approaches: an economic base approach and an input-output approach. Tr. 2289-92. Both approaches are designed to measure the "base jobs" directly dependent upon the use of the Vermejo by direct beneficiaries and to calculate the effect of subtracting those jobs upon others dependent upon them. Tr. 2290-91. The use of these methodologies resulted in computing a loss of between 139 and 153 jobs to the Colfax County economy. Tr. 2296. There would be additional injury to the Colfax County economy. Tr. 2289, 2296. The State of New Mexico would lose \$1,000,000 in severance tax paid by Kaiser Steel. Tr. 2289. There would be a decline in property values and property tax revenues. Tr. 2295. As indicated above, there would be losses in the contributions made by Vermejo Park and Kaiser Steel to various secondary or indirect beneficiaries, particularly in Colfax County.

Colorado made no analysis of the effect of diversions from the Vermejo tributaries on New Mexico. Dr. Brown, however, analyzed the effect of Colorado's diversions on New Mexico with the "impact" methodology in Colorado Exhibit No. 15 Revised. Dr. Brown did what the Colorado exhibit did. He attributed all of the economic benefits to the primary beneficiaries directly to the Vermejo. Tr. 2298. The result was that the loss of water to the primary beneficiaries who are the appropriators themselves would be 600 lost jobs. Tr. 2299. When jobs that rely indirectly on the primary beneficiaries are included this would amount to a loss of 1867 to 1885 jobs. Tr. 2299, 2300. This consists of 31% of the jobs in Colfax County, which constitutes 40% of the total personal income of the County. Tr. 2299, 2300. Under this analysis, there would be losses of \$2,000,000 to \$3,000,000 annually in tax revenues. Tr. 2300-01.

In concluding his discussion of injury in his Additional Factual Findings, the Master does not discuss the existing economy in New Mexico because he believes the water supply is sufficient to sustain the "current," albeit severely reduced, uses:

New Mexico represents an impressive array of figures allegedly representing the economic injury resulting from reduced water supply. However, for the most part these figures presuppose that no Vermejo River water is available for New Mexico users, and such is not the case even if New Mexico does not implement any additional conservation measures. Report of May 31, 1983 at 27.

The Master has not described to New Mexico or the Court a single specific conservation measure available to New Mexico, much less discussed its financial and engineering feasibility. It is true that the economic injury described by New Mexico depends upon a reduced water supply, but the Master would guarantee

that there would be no water supply for 3,840 acres of New Mexico's reasonable entitlement of 9,111 acres. The record also shows that there would be additional injury in both low flow and high flow years. What the injury would be precisely would depend on nature. The Court can be assured, however, that the injury would be substantial.

POINT VII

AN EQUITABLE APPORTIONMENT BASED UPON AUGMENTATION OF SUPPLY PROVIDES NO BASIS UPON WHICH TO REARRANGE PRIORITIES INTERSTATE.

In *Colorado v. New Mexico*, 103 S. Ct. 539 (1982), the Court discussed certain factors it deems appropriate in determining whether to apply the guiding principle of priority of appropriation or to depart from it. Three factors can be gleaned from the Court's discussion: (1) whether, consistent with historical water shortage, the rights sought to be protected have been utilized diligently and in good faith; (2) whether reasonable conservation measures are available to "offset" the proposed Colorado diversion; and (3) whether the cessation of any waste or inefficiency would effectively augment the water supply.

While the Master has neither properly weighed the evidence nor made specific findings in his consideration of these factors, he reached his conclusions — albeit erroneous — on the basis of his view that the proposed diversion in Colorado could be made possible through strict conservation measures which would "offset" it, *i.e.*, augment the existing supply in an amount sufficient to facilitate making the new use.

The factors discussed by the Court and considered by the Master are factors which might make water available for a new junior appropriation. They are not factors which might warrant a

restructuring of priorities interstate, assuming the water were thus made available. In making his recommendation of an award to Colorado, however, the Master has suggested to the Court that C. F. & I be awarded the first priority on the Vermejo River.

In the circumstance presented in this case, *i.e.*, a proposed new use on an admittedly fully appropriated river, there is no justification in law, logic, or equity for awarding an apportionment on the basis of an augmented water supply and simultaneously awarding the first priority to the new use. *Arizona v. California*, 373 U.S. 546 (1963); *Wyoming v. Colorado*, 259 U.S. 419 (1922); *Nebraska v. Wyoming*, 325 U.S. 589 (1945). The Master has recommended doing so without the slightest bit of explanation for his recommendation.

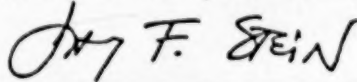
While the Court can equitably apportion interstate water for a new use upon the consideration of factors which might augment the supply, this would not provide reason to depart from priority of appropriation. If the Master's recommended apportionment were to be adopted notwithstanding its total lack of factual support, the Court must not, as the Master would, subvert the security of the existing property rights in New Mexico as an afterthought.

CONCLUSION

In its absence of specific findings to support an apportionment of the Vermejo, the Master's report reflects his continued reliance on the rejected view that Colorado is entitled to Vermejo water because some of its waters rise within Colorado. Report of May 31, 1983 at 23,29. The Court expressly disallowed this as a basis of decision. 103 S. Ct. at 544, n.8. Colorado has failed to provide the Special Master with the evidence on which to base specific findings and thus has failed to sustain the burden of proving that Colorado's claims are of "serious magnitude" or that its case is proved by "clear and convincing evidence."

In his analysis of each of the five points on which the Court requested a detailed factual analysis, the Master's report is replete with error and unproven assumptions. On the issues of New Mexico's existing uses, the hydrology of the Vermejo River, and injury to New Mexico, the Master has failed to examine the facts and to report them to the Court. The Master's recommendation that Colorado should be awarded 4,000 acre-feet should be rejected and the case should be dismissed.

Respectfully submitted,
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CERTIFICATE OF SERVICE

I, Jay F. Stein, hereby certify that I am a member of the bar of this Court and that on August 11, 1983, pursuant to Rule 28 of the Rules of the Supreme Court of the United States, I caused to be mailed the requisite number of copies of the foregoing Exceptions and Brief in Support of Exceptions, by first class mail, postage prepaid, to the following officials of the State of Colorado:

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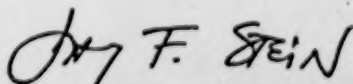
I certify that on August 11, 1983, pursuant to Rule 28 of the Rules of the Supreme Court of the United States, I caused to be served by express mail, postage prepaid, the requisite number of copies of the foregoing Exceptions and Brief in Support of Exceptions on the following counsel of record:

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I certify that all parties required to be served have been served.



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